



# Possible Design for a National Greenhouse Gas Emissions Trading Scheme

A Discussion Paper prepared by the National Emissions Trading Taskforce

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The Discussion Paper is prepared on behalf of the State and Territory Governments of Australia for public comment. The Discussion Paper aims to obtain feedback from stakeholders to assist Government better understand and assess the costs and benefits of a possible future greenhouse gas emissions trading scheme. The Discussion Paper does not represent agreed policy by participating States and Territories.

## Foreword

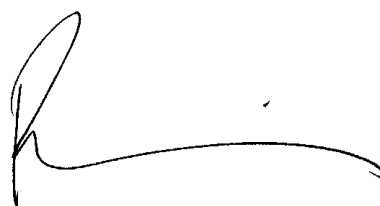
This Discussion Paper has been prepared by the National Emissions Trading Taskforce, which reports to the Premiers and Chief Ministers of all Australian States and Territories.

The paper sets out a possible design for a national emissions trading scheme. The scheme is designed to achieve long term reductions in greenhouse gas emissions in an economically efficient way. It aims to provide a framework for emissions reduction that gives business and the community certainty and predictability.

The underlying motivation for advancing a Discussion Paper on such a scheme is the view that the future prosperity of Australia may be better served by taking early action to adapt to a “carbon constrained” world, rather than putting off action and risking a shock to the economy and society. The fundamental obligation of governments is to create a robust and predictable regulatory framework within which new technology and innovation can be developed and applied - to create incentives and rewards for improved environmental outcomes.

The Taskforce has taken care to try to understand and address the impacts that emissions trading could have on different sectors and groups within Australian society and the economy. Importantly, the scheme provides for a gradual start, and for assistance to sectors which might otherwise be adversely affected.

Public consultation, feedback and comment on the proposals in this paper will be critical in informing refinements to the design, and the decision of Premiers and Chief Ministers about how to proceed.

A handwritten signature in black ink, consisting of a large, stylized capital 'R' followed by a long, horizontal, slightly wavy line that tapers off to the right.

Roger Wilkins  
Chairman  
*National Emissions Trading Taskforce*

## **Background to this Discussion Paper**

*This Discussion Paper sets out a possible scheme design for a national greenhouse gas emissions trading scheme. It has been prepared by the National Emissions Trading Taskforce in response to a request by First Ministers of State and Territory Governments. Public comment is sought on all aspects of this proposal, including views on whether States and Territories should pursue emissions trading in the absence of Commonwealth support and in the absence of an agreed international approach, and views on how varying impacts across regions and industries can be best managed.*

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In January 2004, First Ministers of State and Territory Governments established a working group of senior officials (subsequently named the National Emissions Trading Taskforce) to develop a model for a national emissions trading scheme (NETS).<sup>1</sup>

The National Emissions Trading Taskforce ('the Taskforce') reported progress to First Ministers in December 2004, including the development of the following 10 key design propositions as a basis for further investigation and analysis of a NETS:

1. A cap and trade approach should be used as the basis for scheme design.
2. The scheme should be national and sector based.
3. In setting the cap, consideration should be given to the overall national emissions abatement target, and how abatement responsibility is allocated between sectors covered by the scheme and those outside the scheme.
4. The scheme should initially cover the stationary energy sector (including electricity, gas and coal).
5. The scheme should cover all six greenhouse gases under the Kyoto Protocol.
6. Permit allocation should be made on the basis of a mix of administratively allocated and auctioned permits, with both long- and short-term (annual) permits.
7. A penalty should be set to encourage compliance and to establish a price ceiling for the permit market.
8. Offsets should be allowed.
9. Mechanisms should be included to address any adverse effects and structural adjustments.
10. Mechanisms should be included to allow a transition for participants who have taken early abatement action and new entrants.

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<sup>1</sup> The terms of reference and other information are available at <http://www.emissionstrading.net.au>

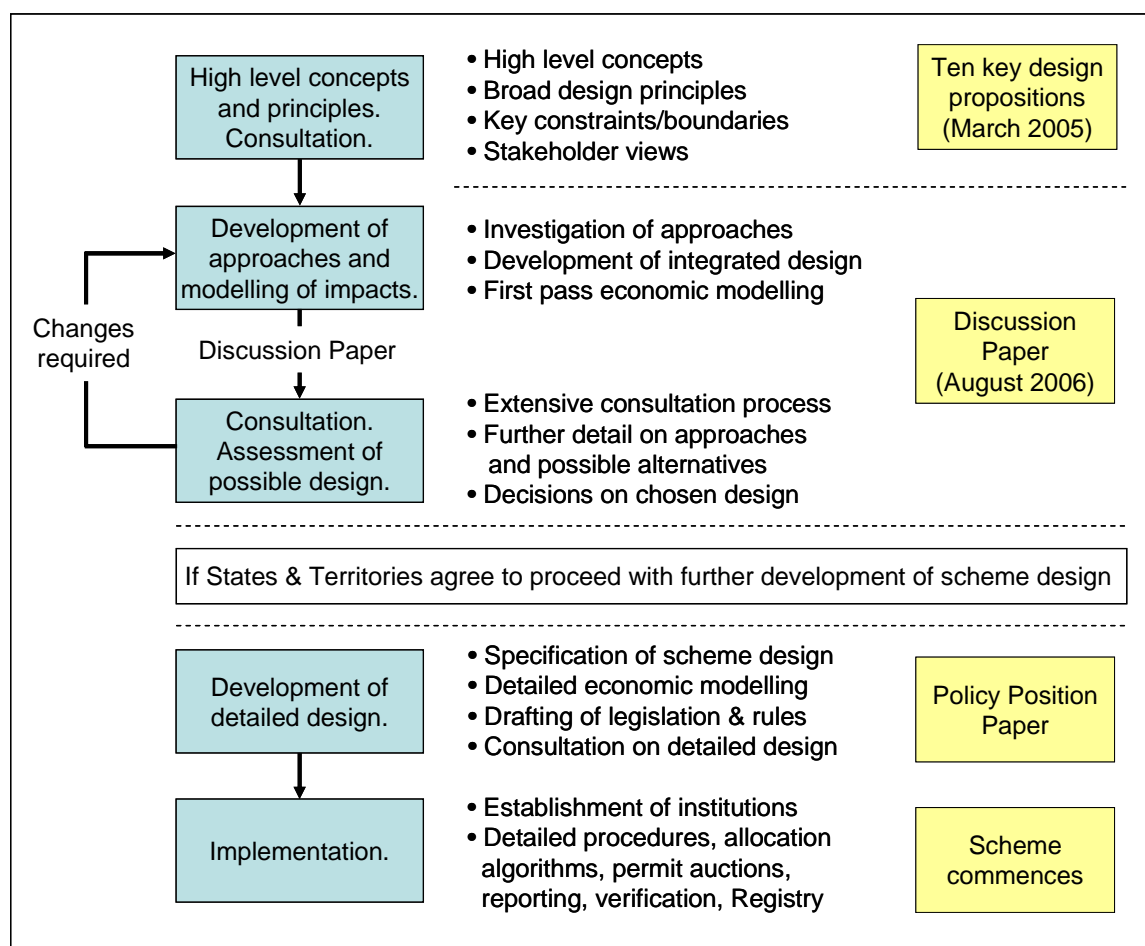
In March 2005 First Ministers released a joint communiqué outlining work to date and issues for further consideration.

In September 2005 the Taskforce released a paper, *The Background Paper for Stakeholder Consultation into Emissions Trading* (the 'Background Paper'), seeking stakeholder views on the 10 design propositions. In total, 70 submissions were received.

The Background Paper provided a basis for stakeholder forums that were held in Perth, Adelaide, Melbourne, Sydney and Canberra during the period October 2005 to February 2006.

The Taskforce also engaged consultants to estimate the likely impacts of a NETS on the electricity sector and the broader economy.

**Figure A. Illustration of the NETS design process**



Industry and Environment Stakeholder Roundtables canvassed key issues and options for the design of a national emissions trading scheme. Meetings were held with the Stakeholder Roundtable Groups during April 2006.<sup>2</sup>

The above stakeholder input and modelling informed the development of this Discussion Paper. Figure A (on the previous page) is an illustration of the design process for the NETS culminating with the release of this Discussion Paper. This is an important time for stakeholders to provide input and be part of the consultation process.

Chapter 14 outlines how stakeholders can respond to the issues identified in this Discussion Paper and participate in the process in the future.

Any decision on whether to progress further development of the NETS will be made by State and Territory Governments following feedback from stakeholders on this Discussion Paper.

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<sup>2</sup> Organisations invited to participate in the Industry Stakeholder Roundtable were the Business Council for Sustainable Energy, Investor Group on Climate Change, Energy Users' Association of Australia, A3P, Auswind, Energy Retailers' Association of Australia, National Generators' Forum, Renewable Energy Generators Australia, Energy Supply Association of Australia, Energy Markets Reform Forum, Minerals Council of Australia, Insurance Council of Australia, Australian Coal Association, Australian Industry Greenhouse Network, Australian Aluminium Council, National Association of Forest Industries, APPEA, Cement Industry Federation, Australian Chamber of Commerce and Industry, Plastics and Chemicals Industry Association and Australian Industry Group. Organisations invited to participate in the Environmental Stakeholder Roundtable comprised the Total Environment Centre, WWF, Australian Conservation Foundation, Environment Victoria, Friends of the Earth, Greenpeace, and Climate Action Network Australia.

# Contents

Foreword.....	i
Background to this Discussion Paper .....	ii
Contents.....	v
Key messages .....	viii
Executive summary .....	x
A Possible Design for a National Emissions Trading Scheme .....	x
Reducing emissions by mid-century .....	xii
Why emissions trading? .....	xiii
Potential scheme start .....	xiv
Objectives of scheme design .....	xv
Coverage .....	xv
Scheme cap .....	xvi
Banking and borrowing .....	xx
Estimated economic impacts of reducing emissions through the scheme .....	xx
Penalty .....	xxiv
Offsets .....	xxv
Permit allocation.....	xxvi
Institutional arrangements .....	xxix
Emissions monitoring, reporting and verification .....	xxx
Establishment and transition .....	xxx
Linking with international schemes .....	xxxi
Complementary measures .....	xxxi
Next steps.....	xxxii
<b>1 The need for action.....</b>	<b>1</b>
1.1 The case for a national emissions trading scheme in the stationary energy sector .....	1
1.2 The problem of climate change .....	6
1.3 Reducing emissions significantly by the middle of the century.....	9
1.4 Why emissions trading?.....	10
1.5 Objectives of scheme design .....	12
1.6 Commonwealth Government involvement.....	13
1.7 Potential scheme start.....	13
1.8 Outline of this Discussion Paper.....	14
<b>2 Coverage.....</b>	<b>15</b>
2.1 Sectors to be covered by the NETS.....	15
2.2 Coverage of stationary energy emissions .....	16
2.3 Coverage of fugitive emissions .....	25
2.4 Coverage by type of greenhouse gas .....	28
2.5 Future changes to scheme coverage.....	30
2.6 Emission sources excluded from scheme coverage.....	32

---

2.7	Scheme coverage over time.....	33
2.8	Conclusion.....	35
<b>3</b>	<b>Scheme cap.....</b>	<b>37</b>
3.1	Setting the scheme cap.....	37
3.2	Adjusting the cap for increased scheme coverage.....	49
3.3	Banking and borrowing.....	51
3.4	Conclusion.....	54
<b>4</b>	<b>Penalty and make-good provisions.....</b>	<b>55</b>
4.1	Compliance with the scheme cap.....	55
4.2	Penalty.....	55
4.3	Make-good provision.....	59
4.4	Conclusion.....	61
<b>5</b>	<b>Offsets .....</b>	<b>62</b>
5.1	Role of offsets in emissions trading schemes.....	62
5.2	Why include offsets in the NETS? .....	62
5.3	Key design considerations .....	64
5.4	Priority areas for offsets .....	76
5.5	Extension of eligible offsets.....	81
5.6	Offset credits from other schemes.....	83
5.7	Conclusion.....	85
<b>6</b>	<b>Estimated impacts of addressing greenhouse gas emissions through the NETS .....</b>	<b>86</b>
6.1	Background.....	86
6.2	The modelling approach.....	87
6.3	Results of electricity market modelling.....	92
6.4	Results of economy-wide modelling .....	109
6.5	Caveats on modelling results.....	113
6.6	Conclusion.....	114
<b>7</b>	<b>The nature of permits, permit allocation and assistance measures .....</b>	<b>118</b>
7.1	Permits in the NETS .....	118
7.2	A national approach to permit allocation .....	118
7.3	The nature of permits: short term or long term?.....	118
7.4	Permits as property rights .....	120
7.5	Permit allocation .....	121
7.6	Permit allocation for transitional assistance.....	124
7.7	Assistance to generators.....	124
7.8	Assistance to trade-exposed, energy-intensive industries .....	131
7.9	How long should assistance to trade-exposed, energy-intensive industries last?.....	137
7.10	Treatment of closing firms .....	138
7.11	Assistance to other groups.....	143
7.12	Summary of allocation proposals .....	145
<b>8</b>	<b>Institutional arrangements .....</b>	<b>146</b>
8.1	Institutions required to implement emissions trading .....	146



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8.2	Intergovernmental agreement .....	146
8.3	Legislation.....	147
8.4	Institutional arrangements.....	149
8.5	Reviews.....	154
8.6	Stakeholder involvement.....	155
8.7	Conclusion.....	156
<b>9</b>	<b>Emissions monitoring, reporting &amp; verification .....</b>	<b>157</b>
9.1	Monitoring, reporting and verification requirements for emissions trading.....	157
9.2	Coverage and timing of monitoring, reporting and verification .....	159
9.3	Adoption of national emissions monitoring and reporting processes .....	160
9.4	Costs of monitoring, reporting and verification requirements.....	161
9.5	Conclusion.....	162
<b>10</b>	<b>Accommodating multiple objectives .....</b>	<b>164</b>
10.1	Emissions trading — weighing the priorities.....	164
10.2	Environmental integrity.....	164
10.3	Investor certainty.....	166
10.4	A manageable transition for the economy .....	169
10.5	Flexibility .....	171
10.6	Equity .....	171
10.7	Lessons from the EU ETS .....	172
10.8	Conclusion.....	176
<b>11</b>	<b>Transitioning to the NETS .....</b>	<b>177</b>
11.1	Setting the foundations for scheme commencement.....	177
11.2	Harmonisation with existing market mechanisms.....	180
11.3	Conclusion.....	191
<b>12</b>	<b>Linking with international schemes.....</b>	<b>193</b>
12.1	Introduction.....	193
12.2	Bilateral linking .....	193
12.3	Influence of design features on future bilateral linking .....	195
12.4	Conclusion.....	202
<b>13</b>	<b>Complementary measures.....</b>	<b>203</b>
13.1	The need for complementary measures .....	203
13.2	Strategies to implement complementary measures .....	204
13.3	Complementary measures applying to covered sectors .....	206
13.4	Measures applying to sectors outside the emissions trading scheme.....	212
13.5	International engagement and negotiations.....	216
<b>14</b>	<b>Next steps .....</b>	<b>218</b>
	<b>Abbreviations .....</b>	<b>219</b>
	<b>Glossary .....</b>	<b>221</b>

## **Key messages**

Climate change threatens the world's and Australia's economic activities, communities and ecosystems. It is in Australia's interests to promote international action to reduce greenhouse gas emissions. Domestic action, potentially including emissions trading, forms part of a credible international negotiating strategy.

It is important to position our economy to be competitive in an internationally carbon constrained future. A national emissions trading scheme in the stationary energy sector could form an important part of that strategy. Fundamentally, stakeholder views are sought on whether States and Territories should pursue an emissions trading scheme in the absence of Commonwealth support, and in the absence of an agreed international approach.

This Discussion Paper sets out a potential scheme design for comment, including considerations of how impacts on regional areas and trade-exposed, energy-intensive industries can potentially be minimised. Stakeholder views on the effectiveness of the proposed measures are sought.

State and Territory Governments invite the Commonwealth to join with them in considering this design.

An emissions trading scheme in Australia could follow the model used by the European Union (EU) and cap greenhouse gas emissions. Permits to emit could be allocated using a mixture of free allocation and auctioning. Compliance could be encouraged, and its costs capped, through the application of a penalty.

A carefully designed emissions trading scheme could help minimise the costs of reducing emissions. Emissions trading is widely regarded as being flexible and efficient for some sectors, potentially including the energy sector. It lets the market establish the best ways of tackling the problem, rather than relying on traditional 'command and control' regulation.

Greater certainty is needed over when and how carbon prices are to be applied in the economy. Uncertainty over future climate change policy is hindering investments in electricity generation and energy-intensive industries. Stakeholder feedback is sought on whether a possible scheme as outlined in this Paper would reduce that uncertainty.

The starting date for the scheme could be as early as 2010. Early commencement with modest emission reduction targets would allow for a gradual transition for the economy. Allowing trading of future emission permits would provide a credible price signal to guide investment decisions on major energy assets required before the end of the next decade, because the planning timeframes for such decisions span several years.

Preliminary modelling work undertaken to date indicates that the proposed design can achieve significant reductions in emissions while maintaining strong economic growth. This modelling suggests that effects on Australian GDP and community welfare associated

with reducing emissions through the scheme are small, and in line with ‘business as usual’ projections, although the specific regional and industry impacts vary with some jurisdictions being more affected than others.

Without taking steps to avoid this outcome, any policy to reduce emissions could affect the competitiveness of Australia’s trade-exposed, energy-intensive industries. A long-term free allocation of permits is proposed to offset the impacts of the scheme on the energy costs faced by these firms. This would help to maintain Australia’s international competitiveness without diluting environmental integrity.

Some generators are likely to benefit from the scheme—particularly renewable and gas-fired generators—while others may be adversely affected. A limited allocation of free permits is proposed for the latter. This can be done in a way that does not dilute their incentives to reduce emissions.

The remainder of permits would be auctioned and the proceeds divided among States and Territories, on a basis yet to be determined, but in a manner that recognises the differing impacts of the scheme. This revenue could be used to assist others, such as households, regions or small business.

Measures to improve energy efficiency and develop and demonstrate new low emissions technologies, such as ‘clean coal’ generation, carbon capture and storage, and renewable energy complement the proposed scheme. Such technologies require an ongoing price signal if they are ever to be commercially deployed.

The potential to generate offset credits is a major opportunity created by the scheme, particularly in the forestry industry. Scope to recognise international offset credits created through the Clean Development Mechanism (CDM) is canvassed.

*Stakeholder comment is sought on all aspects of this proposed scheme design, including possible alternative approaches and solutions.*

## **Executive summary**

### **A Possible Design for a National Emissions Trading Scheme**

This Discussion Paper sets out a possible design for a national emissions trading scheme (NETS). It is a proposal put forward in the national interest, for discussion and response by stakeholders. States and Territories invite the Commonwealth to join with them in considering this approach.

Stakeholders are invited to provide comment on whether an emissions trading scheme should be pursued now, particularly in the absence of uniform international action. However, there are a number of potential benefits in considering a scheme now.

First, clear signals on government policy in relation to emissions trading may assist with reducing the uncertainty faced by investors in energy markets and among energy-intensive industries. Constraints on greenhouse gas emissions are widely regarded as inevitable—it is just a matter of timing. Not knowing when such a constraint will be applied, or in what form, is perceived by many stakeholders as inhibiting decision-making. This Discussion Paper sets out a possible scheme design that, if agreed, would assist investors in making informed and rational decisions about their future.

State and Territory Governments are particularly concerned about the effects of investment uncertainty in the electricity industry, potentially contributed to by a lack of international agreement in relation to greenhouse gas emissions trading. Lead times for major new investments in base load plant typically run to several years. Energy market players are already considering investments for the coming decade. The expected economic life of such plant is at least 40 years. Not knowing what rules will apply to greenhouse gas emissions in the future significantly increases the risks for investors, who are concerned about the risks of very expensive, long-lived assets. The current atmosphere of uncertainty can cause delays in investment until the policy position is clear. If this situation continues, it could mean higher electricity prices and less reliable supply than if the rules were clearly established in advance.

Large investments in energy-intensive industries are also affected by the uncertainty surrounding future emissions constraints in the energy sector, as this could have significant implications for their costs.

Second, taking action in the near future may allow Australia to follow a smoother adjustment path to a carbon-constrained economy. The current weight of scientific evidence indicates that substantial reductions in emissions are required before the middle of the century. Delaying action may mean that Australia faces sharper reductions in emissions with higher total costs and more significant negative impacts on the economy than if the transition were managed in a more gradual way.

Third, domestic action forms part of a persuasive international position on climate change. Global action on climate change is required—and should arguably be actively encouraged—by Australia, given the costs to our own economy, communities and ecosystems that

climate change entails. The demonstration effect of domestic action on other countries should not be underestimated. As responsible global citizens, many Australians are also concerned about the effects of climate change on others, particularly developing countries. Developing countries have contributed least to the problem to date. They are likely to bear the greatest portion of its costs, but are least equipped to do so. Australia taking sensible domestic action to control emissions may help build international confidence and cooperation among the rapidly growing economies in the region in pursuing less greenhouse gas emissions intensive development paths.

#### **Deploying clean coal technologies – the complementary role of emissions trading**

Internationally, coal is expected to continue to be the dominant fuel source for electricity generation to at least 2030 due to its security of supply, widespread availability and cost competitiveness. Clean coal technologies are being developed that have the potential to significantly reduce the greenhouse gas emissions from coal-fired electricity generation to near-zero levels.

An effective research, development and demonstration (RD&D) programme is necessary to support the early stages of innovation and help develop and demonstrate clean coal technologies. Queensland has now committed over \$300 million and Victoria around \$80 million to technology-related RD&D. Both those programmes dovetail with the Commonwealth Government's \$500 million Low Emissions Technology Demonstration Fund (LETDF). The Australian black coal mining industry also recently committed to provide up to \$300 million over the next five years to work with the electricity generation industry to demonstrate technologies for reducing greenhouse gas emissions from coal fired power stations.

These Government and industry programmes are designed to help new technologies get to a stage when they could be commercially deployed on a wider scale. However, such technologies are unlikely to be commercially deployed in the absence of a price on greenhouse gas emissions. An emissions trading scheme could help bridge this 'deployment cost' gap. It could help create a market environment in which it becomes commercially attractive to install abatement technology, such as carbon capture and storage. For electricity generation, such technology would never be viable in its own right without substantial Government subsidies.

Emissions trading could play a valuable complementary role to an effective RD&D programme for clean coal, as well as other abatement technologies. The carbon price from an emission trading scheme is expected to provide incentives for businesses to switch to low emissions coal technologies that are currently available, but require additional economic support. For example, emissions trading would provide incentives for existing coal generators to increase their thermal efficiency and thereby reduce CO<sub>2</sub> emissions. It could also stimulate investment in, and accelerate the deployment of, prospective clean coal technologies that are currently at the experimental and demonstration phase. They include technologies such as black coal integrated gasification combined cycle and brown coal integrated dewatered gasification combined cycle, combined with the ability to undertake carbon capture and storage.

Fourth, in the absence of a price on emissions, there is little or no incentive to deploy existing or new technologies to reduce greenhouse gases. In relation to new technologies, although an emissions trading scheme is not a substitute for technology development policy (a strong focus of the Commonwealth Government and State and Territory Governments) it is an important element in ensuring that new technologies are subsequently deployed. An emissions trading scheme can play an important role alongside a number of existing programs to encourage the commercialisation of new and existing abatement technologies. Many of the current and likely future low emissions technologies are not commercially viable without some form of ongoing support.

Finally, economic modelling undertaken to date indicates that it is possible to reduce greenhouse emissions without major overall economic disruption, although specific impacts on regions and industries vary. The inherent flexibility of emissions trading is a major reason for this. Based on preliminary modelling undertaken for the NETT, strong economic growth appears possible while also reducing greenhouse gas emissions. Carefully considered emissions caps that recognise the pace at which the existing stock of generation capacity can be augmented and replaced by lower emission technologies will help to ensure this.

The scheme can be designed to cap the costs to the economy. A common argument against a domestic emissions trading scheme is that it would damage the international competitiveness of trade-exposed, energy-intensive industries. However, the measures proposed in this Discussion Paper may prevent that outcome. Mechanisms have been included in the proposed scheme design to help protect the international competitiveness of such industries, although stakeholder feedback on their likely effectiveness is sought. Similarly, it is possible to assist others who could be adversely affected by the scheme. The nature of an emissions trading scheme creates an inbuilt source of value to pursue those goals.

## **Reducing emissions by mid-century**

State and Territory Governments are seeking stakeholder views on developing policy that puts Australia on a pathway to reduce our emissions by around 60% compared with 2000 levels by the middle of the century. This is in line with targets announced by the NSW and SA Governments, as well as a number of governments overseas. This would be an economy-wide goal, rather than a sector-specific target.

Placing Australia on a path to reducing emissions by around 60% from 2000 levels by the middle of the century has important implications for nearer-term policy development. Major new investments in the electricity sector in particular will be required in the coming decades. Given their long-lived nature, these plants may still be operating by the middle of the century. It is important to send a signal now to ensure that likely future emissions constraints are taken into account when making investments in such long-lived assets.

## **Why emissions trading?**

Any policies designed to reduce greenhouse gas emissions have associated costs. Compared with alternatives, it is widely acknowledged that emissions trading is a practical, flexible and relatively low cost means of achieving an emissions target for some sectors, potentially including the energy sector. However, stakeholder views on alternative approaches are sought.

Emissions trading appears to be particularly suited to sectors where emissions can be estimated and reported accurately at low cost, where there is a reasonable number of liable parties, and where the transaction costs of covering those liable parties are not unreasonable. Most importantly, emissions trading can encourage abatement activities in markets where price signals are likely to have an influence. Investment and dispatch in electricity markets are prime examples of the sorts of activities in which emissions trading is likely to be effective.

While a number of different potential models for emissions trading exist, the collection of cap and trade models are widely preferred as they better guarantee emissions reductions while the costs can be capped. This is also the basic design of the EU emissions trading scheme and is therefore likely to better facilitate international integration in the future.

### **How does a cap and trade emissions trading scheme work?**

The essential elements of an emissions trading scheme are that:

- emissions are capped at some level in each period
- permits to emit greenhouse gases are issued for each period
- there is a penalty for non-compliance which underpins a value for emissions
- participants can trade these permits among themselves.

The price of permits is not set by governments – rather, it emerges from the market, subject to any upper limit set by governments to constrain economic impacts. Firms are likely to be willing to pay for permits if their internal costs of abatement are higher than the price of permits. Firms would be willing to sell permits if the revenue received from selling permits exceeds the profits from using the permits.

One of the great strengths of an emissions trading scheme is that it is technology-neutral (ie, does not specify suitable technologies). It allows the market to seek out the lowest-cost ways of achieving any particular emissions cap. It does not rely on omniscient governments directing investments and abatement activities through more traditional ‘command and

control’ regulation, or through industry- or technology-specific subsidies. It allows a variety of technologies to be adopted based on commercial competitiveness.

Another strength of an emissions trading scheme compared with alternative measures is that it has an inbuilt mechanism for providing adjustment assistance. Scarce permits to emit greenhouse gases have value. The way in which this initial value is allocated can be used as a way of ensuring that those who are likely to be most adversely affected by the introduction of the scheme are assisted.

A further advantage is that a scheme can be designed to facilitate trading in future emission permits—which provides both market estimates of future emissions costs and an opportunity for companies making long-lived investments to hedge them. In this way, an emissions trading scheme can reduce investment risks in the power and energy-intensive industry sectors.

Finally, a penalty can be included that simultaneously encourages compliance, but places a safe upper limit on the market costs of permits. This makes economic change more manageable.

## **Potential scheme start**

The scheme could commence as early as 2010. Some stakeholders consider that it would be in Australia’s interest to have an early start to the scheme, for reasons that include:

- It allows for a ‘soft start’ and a smooth transition to steeper abatement tasks. Since Australia is on track to meet its Kyoto target, emissions reductions targets in the earliest years of the scheme can be modest.
- A start around 2010 is considered to provide sufficient time for the scheme to be implemented. This would involve passing legislation, regulations and detailed rules. New institutions may need to be created. Experience with the EU ETS suggests that it is critical to have the underpinning emissions monitoring and reporting systems in place and working well before a trading scheme commences. A 2010 start date allows time for these processes to occur in a manner that allows for detailed stakeholder consultation.
- The scheme should preferably be in place in advance of requirements for new base load generation capacity. This is because the lead-times for such investments are long—around six years or more for a new coal-fired plant. It is important that a credible scheme is in place early, to influence these planning decisions.

Stakeholder views are sought on when it may be preferable to start emissions trading in Australia.



## **Objectives of scheme design**

In designing an emissions trading scheme for Australia, there are a number of objectives to take into account. These include:

- **Environmental integrity:** The purpose of the emissions trading scheme is to reduce greenhouse gas emissions. The environmental integrity of the scheme is therefore of central importance in scheme design.
- **Investor certainty:** One of the main drivers for considering an emissions trading scheme is to improve certainty for investors, particularly for investors in long-lived capital in energy markets.
- **Minimising impacts on the economy:** Constraining greenhouse gas emissions in the stationary energy sector must be managed carefully. Economic impacts can be minimised if the scheme is constructed as efficiently as possible, promotes least cost reductions in emissions, and caps the cost of compliance. Also, until such time as there is widespread international action on emissions reductions, the competitiveness of Australian trade-exposed industries must be protected.
- **Flexibility:** The future is uncertain. The scheme needs to be flexible in the face of new information emerging from climate change science, international obligations, and the costs and nature of new technologies.
- **Equity:** The design must provide the means to assist those most adversely affected by reducing emissions through the scheme.

These objectives have shaped the proposals in this Discussion Paper.

## **Coverage**

It is proposed that the scheme would initially cover the stationary energy sector. This represents the largest component of Australia's emissions. Its emissions are projected to continue to grow rapidly in the absence of further measures.

It is widely considered that the coverage of the scheme should be as broad as possible to prevent distortions between emitting activities.

However, this preference for broad coverage is tempered by considerations of practicability and workability. For example, administrative burdens of compliance must not outweigh the benefits of incentives to reduce emissions. For some sectors and activities, more effective and efficient policies might include direct regulation, industry levies or government subsidies. Stakeholder views are sought on preferred approaches for different sectors and activities.

It is proposed that electricity generators with a capacity of over 30 MWe would be covered from the scheme's outset. This would cover an estimated 190 Mt of emissions under business as usual (BAU) from around 100 facilities in 2010. Additional emissions from other sources of stationary energy emissions (over 25,000 t CO<sub>2</sub>-e a year, including imputed emissions from retail natural gas sales), plus fugitive emissions from gas pipelines, could be phased in at the end of the first five years of the scheme. Extending coverage to these sectors would increase coverage to around 275 Mt under BAU from around 250 facilities in 2015, or around 45% of national emissions at that time. Comment is sought on whether or not such phasing of coverage is desirable.

The design of the scheme has been developed such that additional sectors could be added over time.

All six types of greenhouse gases covered by the Kyoto Protocol are proposed to be covered. Several of these gases are not emitted by the proposed liable parties but would be relevant for offset creation.

## **Scheme cap**

The scheme cap sets a limit on the number of tonnes of greenhouse gas emissions that could be emitted by the covered sectors without incurring a penalty. Determining the duration, trajectory and level of the cap for the NETS is a fundamental design issue. It defines the magnitude of the abatement task and significantly affects most other scheme design choices.

There are a number of key considerations in setting the scheme cap.

First, the scheme cap should preferably be consistent with a long term reduction target. Stakeholder views are sought on setting Australia on a path towards reducing greenhouse gas emissions by around 60% compared with 2000 levels by the middle of the century.

Second, in determining the trajectory of emission reductions, the cap should allow for the Australian economy to transition as smoothly as possible to a carbon-constrained future. Australia has an energy-intensive economy that obtains its competitive advantage from low-cost and abundant fossil fuels. A cap appropriately geared to the rate at which the economy can adjust would ensure that any costs to the economy in the short to medium term were manageable, and would help position industry and the community generally for potentially much larger reductions in emissions in the future.

Third, the cap should be able to respond flexibly to the evolving scientific understanding of climate change.

Fourth, cap-setting should consider the realities of the energy market. The electricity generation industry is characterised by lumpy, long lived investments. Once built, new generation plant is likely to last for many years – at least 40 years. The cap-setting process

should also consider the need for new investment in generation plant, refurbishment and retirement of existing plant, and the cost and availability of low emission technologies. It will need to incorporate an assessment of the extent to which low cost energy efficiency options are available.

The cap also needs to move in step with the evolution of low emission technologies, and their potential commercialisation and deployment. The costs of renewable technologies, as well as lower emissions coal-fired technologies, are currently high, but likely to fall over time. However, considerable uncertainty surrounds the future commercialisation and cost of these technologies.

Finally, given that the framework for international climate change action beyond 2012 remains uncertain, the cap should be able to adjust flexibly to reflect future international obligations. The scheme should provide a framework within which the market can make judgements about the direction of these future cap movements while preserving a reasonable degree of investor certainty.

Kyoto Protocol ratifying countries agreed in December 2005 to start negotiations to extend commitments under the Kyoto Protocol beyond 2012. An agreement was also made to launch talks under the United Nations Framework Convention on Climate Change (UNFCCC) to which non-Kyoto ratifying countries, including Australia and the United States, are also parties. Australia is to co-chair the Dialogue on Long-term Cooperative Action on Climate Change, which will discuss global action post-2012. These discussions are at a preliminary stage and it may be wise to consider domestic action on the assumption that there will be an early and clear conclusion to the negotiations.

The period for which caps are set and permits issued has important implications for investor certainty, as well as for the flexibility of governments to respond to future developments.

A short cap and allocation period—say 5 years—is unlikely to provide investors with sufficient certainty to make investments. Investments in the stationary energy sector are typically long-lived and require long lead times. A short cap period is therefore likely to see investors defer decisions to replace ageing plant or to meet growing power demand. One of the key criticisms of the European Union Emissions Trading Scheme (EU ETS) is that the first two phases of the scheme (2005–07 and 2008–12) are too short to provide sufficient certainty and predictability for companies making investment decisions on long-lived assets (see Chapter 10).

A longer-term cap and allocation period—say 30 years—would provide greater investor certainty. However, this would be at the expense of flexibility. Governments would face the risk that the cap might need to be altered in the future should, for example, an international agreement on climate change action emerge that requires more (or less)

aggressive abatement than was envisaged under the original cap. Long term caps and permit allocations would transfer risks in the following ways:

- If the original cap were too loose, risks would be transferred to taxpayers. This is because governments would be required to buy back permits that they had previously distributed.
- If the original cap were too restrictive, risks would be transferred to those who had invested in more expensive abatement options than they might otherwise have selected; to holders of permits (the value of which would be reduced if additional permits were issued); and to offset creators, whose activities would become less valuable if the cap were loosened.

It is proposed that firm annual caps would be set for the first 10 years of the scheme. Every year, the firm cap would be extended by another year.

The upper and lower bounds of possible future caps ('gateways') are proposed for the second 10 years and extended on a five-yearly basis. These gateways provide the limits within which firm annual caps may be extended.

Permits with 'date stamps' related to each year would be issued in advance, up to the lower bound of the gateway. The date stamp refers to the first year in which the permit becomes valid. This would add to the credibility of the gateway, provide a strong foundation for large, long-term investment over the period, and facilitate a liquid permits market with its associated emissions price profile.

The level of the overall scheme cap and its trajectory are critical design choices that require considered analysis and appropriate opportunity for stakeholder comment. Accordingly, *indicative* caps are presented to inform such analysis and feedback.

**Further stakeholder input and modelling would be required before any decisions on caps could be made.**

The indicative scenarios modelled include:<sup>3</sup>

- **Scenario 1:** Under this scenario, electricity generation emissions are capped at 176 Mt in 2030, which is approximately the level of electricity generation emissions in 2000. It represents a 33%, or 88 Mt, reduction on forecast electricity generation emissions under business as usual in 2030, and a reduction of 5%, or 10 Mt, compared with emissions in 2005.

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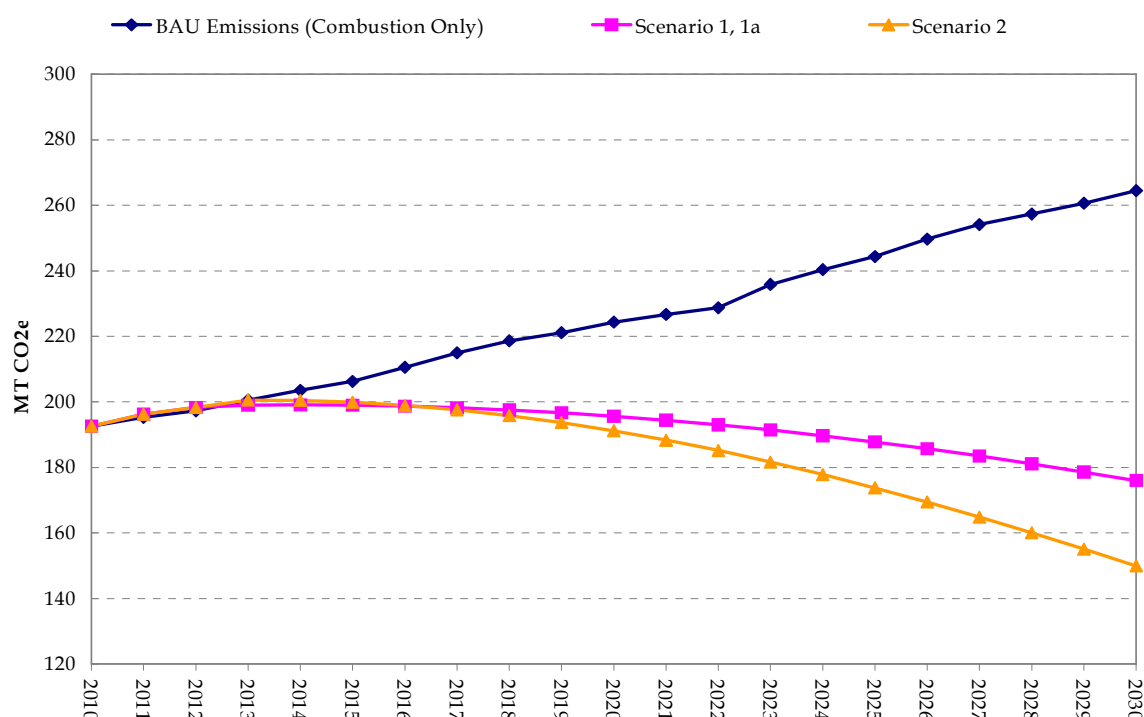
<sup>3</sup> The take-up of some offsets under these scenarios has been estimated as part of preliminary modelling. Scenarios 1 and 2 assume the same levels of offsets—26 Mt and 35 Mt over the periods 2010–19 and 2020–30, respectively. Chapter 6 discusses the sensitivity of the results with an assumption of greater availability of offsets.

- **Scenario 1a:** This scenario is a sensitivity on Scenario 1 that assumes the same cap (176 Mt), but with higher levels of energy efficiency, biosequestration offsets and induced (demand side) technological change. The main purpose of this scenario is to illustrate the extent to which the costs of achieving this cap could be reduced with complementary measures.
- **Scenario 2:** Under this scenario, electricity generation emissions are capped at 150 Mt in 2030, which is approximately the level of electricity generation emissions in 1997. It represents a 43%, or 114 Mt, reduction on forecast electricity generation emissions under business as usual in 2030, and a reduction of 19%, or 36 Mt, compared with emissions in 2005.

Figure 0-1 shows the indicative caps modelled for the electricity sector only compared with projected electricity generation emissions under BAU.

In practice, caps would need to be adjusted when other elements of stationary energy are covered. For modelling purposes, firm caps were only applied to the electricity generation sector.<sup>4</sup>

**Figure 0-1: Indicative scheme caps for the electricity sector**



Source: MMA (2006), *Impacts of a National Emissions Trading Scheme on Australia's Electricity Markets*.

<sup>4</sup> In the economy-wide modelling, the same emissions price emerging from the electricity generation sector was applied to the rest of the stationary energy sector from 2015, to assess likely economic implications.

## Banking and borrowing

It is proposed that liable parties would be able to bank permits indefinitely. Unrestricted banking would provide scheme participants with compliance flexibility, encourage early emission reductions and reduce compliance costs, while also enabling a smooth transition path for permit prices. Stakeholder views are sought on this approach, such as whether any limits on banking (such as banking in 10-year blocks) would be desirable.

It is proposed that the scheme should not allow borrowing, because of the risk of default on outstanding obligations, and because it is assumed that market contracting solutions could effectively accommodate any shortfalls.

## Estimated economic impacts of reducing emissions through the scheme

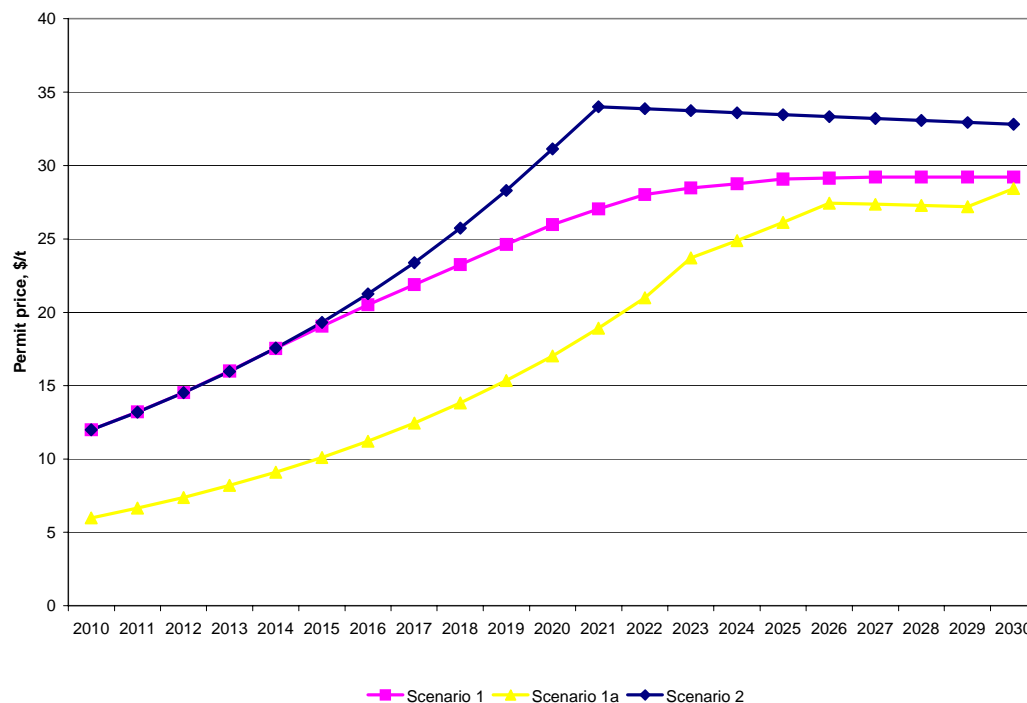
The NETT commissioned economic modelling to examine the potential implications of the *indicative* scheme caps on the electricity sector and the broader Australian economy. Overall, these results indicate the economy would continue to grow strongly with a carefully designed emissions trading scheme. Importantly, it would appear that some industries and regions most vulnerable to the effects of introducing an emissions trading scheme—trade-exposed, energy-intensive industries—could be successfully sheltered from the impacts of the scheme in a way that maintains their competitiveness but does not limit the amount of abatement that occurs.

The modelling work undertaken to date is informative, providing ‘order of magnitude’ impacts. However, this work is only a first step and is subject to some important caveats (see section 6.5). Further modelling will be undertaken to inform decisions on a scheme design that best maintains Australia’s economic prosperity and growth, informed by stakeholder feedback.

*Comment is sought on all aspects of the modelling.*

Figure 0-2 shows the estimated permit prices that result from the *indicative* caps modelled in the electricity generation sector. Permit prices reflect the stringency of the caps—the lower (stricter) cap for the electricity generation sector in Scenario 2 leads to higher permit prices than in Scenario 1. Scenarios 1 and 1a have the same emissions caps and trajectories to 2030. However, increased uptake of energy efficiency and biosequestration offsets is assumed in Scenario 1a which leads to lower permit prices than in Scenario 1, particularly in the early years of the scheme.

**Figure 0-2: Estimated permit prices**



Source: MMA (2006), *Impacts of a National Emissions Trading Scheme on Australia's Electricity Markets*.

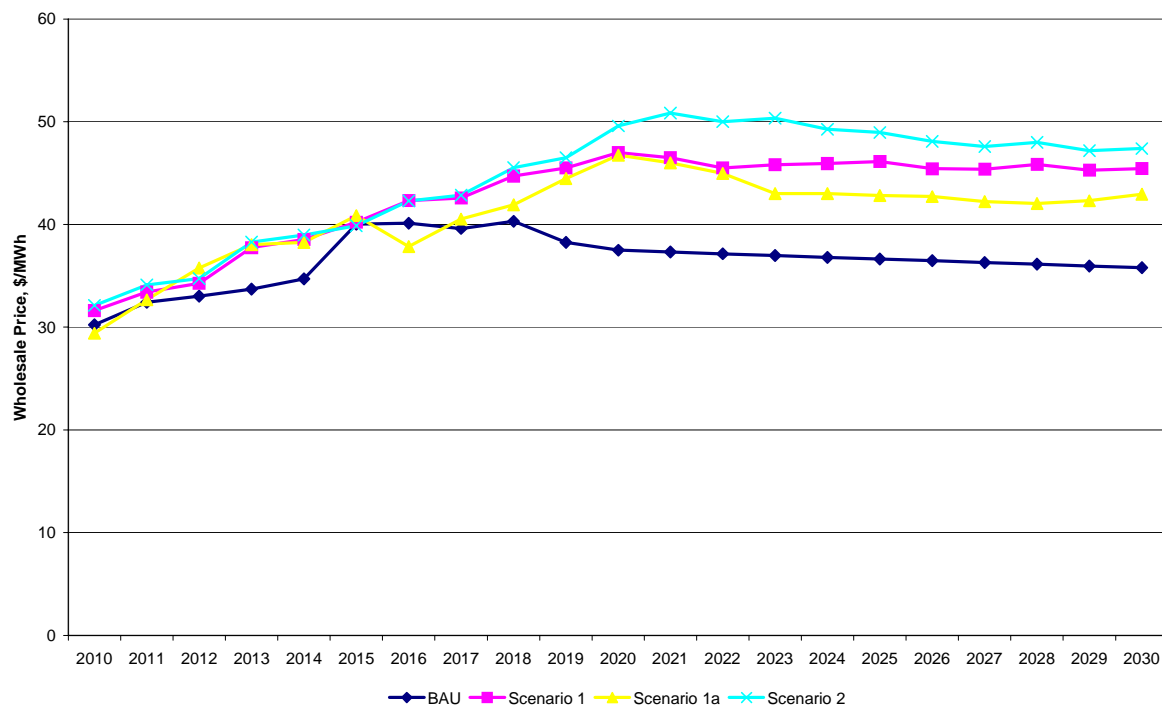
Australia's emissions would have been 782 Mt in 2030 under business as usual. By comparison, emissions are 710 Mt and 695 Mt in 2030 in Scenarios 1 and 2, respectively. The stimulation of greater energy efficiency and offsets in Scenario 1a reduces emissions from 710 Mt to 691 Mt in 2030, relative to Scenario 1.

The impact on wholesale electricity prices relative to BAU is estimated to be small in the initial years of the scheme, but is predicted to rise over time as the permit price increases in response to tighter caps. Estimated effects on wholesale electricity prices in the NEM are shown in Figure 0-3.

Wholesale prices increase in all the scenarios in the SWIS and DKIS relative to business as usual and are greater than for the NEM because of limited fuel switching opportunities in those markets.

The impact on retail prices is lower than that on wholesale prices because the cost of electricity is only part of the total retail price to consumers. Retail price increases are relatively higher in the SWIS and DKIS compared with the NEM. The retail price impact would vary by customer class because the wholesale price comprises a different proportion of customer energy bills.

**Figure 0-3: Estimated wholesale prices—National Electricity Market**



Source: MMA (2006), *Impacts of a National Emissions Trading Scheme on Australia's Electricity Markets*.

The additional average weekly expenditure on electricity<sup>5</sup> compared to business as usual over the period from 2010–30 varies by State:

- \$1.00 per week in Victoria to \$3.20 per week in the Northern Territory for Scenario 1.
- \$0.70 per week in South Australia and Victoria to \$2.20 per week in the Northern Territory for Scenario 1a.
- \$1.20 per week in Victoria to \$3.60 per week in the Northern Territory for Scenario 2.

The relative increase across the States and Territories reflects both the variation in the relative increases in electricity prices as a result of emissions trading and variations in the amount of electricity used by households across jurisdictions. Jurisdictions with relatively

<sup>5</sup> The additional average weekly expenditure on electricity was calculated by multiplying the weekly average consumption of electricity by States (as published by the ESAA) by the average increase in retail electricity prices in \$/MWh. For the NEM, an average increase in retail prices across all NEM States was used.



higher levels of electricity consumption at the household level (for example, Tasmania, Northern Territory, Queensland and New South Wales) have a higher relative increase in average weekly expenditure than states with relatively low levels of electricity consumption (usually jurisdictions with households connected to gas networks such as Victoria and South Australia). Impacts across regions within States and Territories also varied with some being more adversely affected than others.

In terms of the broader macroeconomic impacts of the *indicative* caps modelled, the results indicate that GDP and consumption remain in line with business as usual projections. With the level of GDP down by less than 0.6% in level terms at 2030, it would take less than 3 months to recover the reduction in GDP in 2030 in any scenario, although the economic impacts do vary by region. This impact needs to be considered in the context of the impacts of other economic events. For example, the drought in Australia earlier this decade cost the economy \$13 billion (1.6% of GDP) and about 70,000 jobs by 2003.<sup>6</sup> Also, each 50 basis point rise in interest rates is estimated to reduce GDP by between 1 and 1.2%. For an interest rate rise of 25 basis points, the estimated impact on GDP is around 0.5-0.6%.<sup>7</sup>

The industry predicted to experience the greatest growth compared with business as usual in all scenarios is the renewable generation industry. The renewables sector would be expected to expand by over 400% (an absolute change of around \$800 million in production value) at 2020 in Scenarios 1 and 2. This strong growth is off a small base and is driven by the permit prices making renewables more competitive in the electricity market.

The gas-fired electricity generation sector would be expected to increase in Scenarios 1 and 2. Like renewables, this expansion is driven by permit prices, which make this sector increasingly competitive.

The growth in this sector does not occur with the additional complementary policy measures (modelled in Scenario 1a) because the additional demand side response reduces total energy consumption and gas output. As a result, this sector contracts by \$130 million relative to business as usual at 2020. This contraction is smaller than that for coal-fired electricity, at \$692 million. After 2023, higher permit prices make gas-fired electricity relatively more competitive than under business as usual, resulting in subsequent expansion above business as usual.

Output in the forestry products industry is expected to expand in all scenarios. The expansion is greatest in Scenario 1a, where enhanced uptake of biosequestration offsets for a given carbon price results in the industry expanding by around 50 per cent to approximately \$1.2 billion by 2030.

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<sup>6</sup> Australian Bureau of Statistics (2004), 5249.0 - Australian National Accounts: Tourism Satellite Account, 2003-04, Australian Bureau of Statistics, Canberra.

<sup>7</sup> Centre of Policy Studies, email communication to Taskforce Secretariat, 30 June 2006.

The coal-fired electricity sector is projected to grow at a slower rate than business as usual in all scenarios. The impact is greatest in Scenario 2 due to higher permit prices brought about by the more stringent cap on emissions in the electricity sector. Nevertheless, coal continues to be the dominant source of electricity, accounting for around 54% of electricity supplied (compared with 75% under business as usual).

Other services linked to overall levels of economic activity and new investment, such as transport services, building products and cement manufacture, would be projected to grow slightly more slowly than in business as usual in all scenarios.

The alumina and aluminium industry is not adversely affected by the rise in energy prices, as this has been offset by a free allocation of permits (modelled as a production subsidy).

## **Penalty**

Compliance with the scheme cap can be encouraged by applying a penalty in the event that a liable party has insufficient permits to cover its emissions during a compliance period.

The penalty can potentially serve two important purposes:

- encouraging compliance, and thus promoting the environmental integrity of the scheme
- capping the cost of compliance and providing certainty to investors about the maximum costs of the scheme.

It is proposed that a civil penalty be set at a level that caps the cost of the scheme at an acceptable level but also encourages compliance. The penalty would be applied against each tonne of emissions for which a permit had not been surrendered. The penalty would be identical across jurisdictions.

An additional incentive to meet the cap and maintain the environmental integrity of the scheme could be provided through the use of a 'make-good' provision. Such a provision requires a scheme participant whose emissions exceed its permit holdings at the end of a compliance period to pay a penalty, as well as to surrender an equivalent number of permits. However, this would vitiate the possible role of the penalty as a cap on the costs of compliance. It is not proposed to include a make-good provision.

## **Offsets**

It is proposed that activities that offset greenhouse emissions could generate ‘offset credits’ when they reduce emissions in a way that is recognised by the scheme rules. Once created, an offset credit could be surrendered to make up the difference between a firm’s total emissions covered by the emissions trading scheme and the number of permits that it holds at the end of the compliance period.<sup>8</sup> Offset credits therefore have an equivalent emissions value as a permit in the emissions trading scheme (that is, 1 t CO<sub>2</sub>-e).

The inclusion of offsets in the NETS would broaden the scope of the scheme by providing an incentive to undertake projects that would not otherwise have been influenced by the emissions price. In doing so, offsets would help increase the liquidity of the market and lower the overall cost of meeting the cap.

Any offsets regime introduced under the NETS would need to ensure that the environmental integrity of the scheme itself was maintained. This means ensuring that offsets meet strong additionality, permanence and measurement criteria and that baseline and monitoring methodologies are robust.

It is proposed that, as a general principle, the rules governing the creation of offsets under the NETS should be consistent with emerging approaches being developed for the Joint Implementation (JI) mechanism under the Kyoto Protocol. Consistency with these approaches would not only help ensure the credibility of offsets, but would also capitalise on years of international experience and learning.

A number of priority areas for the development of methodologies for offsets have been identified: forestry; carbon capture and storage; reductions in industrial process emissions; and destruction of methane in the waste sector. It is proposed that a flexible approach be adopted that would allow project proponents to submit methodologies for projects in other areas. These would then be reviewed by the Scheme Developer (see below) against set criteria designed to protect the integrity of the scheme. Projects for which methodologies were approved would be eligible to create offset credits.

It is proposed that credits created under the CDM of the Kyoto Protocol (excluding temporary credits) be accepted as equivalent to other offset credits under the NETS. This would provide an important connection between the Australian and international carbon markets and act as an additional safety valve for the price of domestic abatement. However, given the uncertainties about the availability and cost of such international credits, and the need to ensure that the transition towards a less emissions-intensive energy sector is commenced in Australia, comment is sought on whether any restrictions on access to such international credits are required.

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<sup>8</sup> These permits may be those that the firm was originally allocated or those that it has subsequently purchased in the market.

## **Permit allocation**

At the heart of any emissions trading scheme is the tradable permit to emit. At the end of each compliance period, liable parties would be required to surrender sufficient permits to cover their greenhouse gas emissions in that period.

It is proposed that each permit would give the holder the right to emit 1 t CO<sub>2</sub>-e. Each permit would be ‘date-stamped’ with the year in which it first became valid (its vintage).

How permits are initially allocated throughout the economy can have significant efficiency and equity implications. They can be allocated to ameliorate the effects on those who are likely to be most adversely affected by the scheme. This must be done in a way that does not create perverse incentives to continue to emit, which would increase the costs of the scheme overall.

It is proposed that permits would be allocated in three broad tranches:

- Some permits would be allocated for free to those existing generators estimated to be significantly adversely affected by the scheme.
- Some permits would be allocated for free to firms in trade-exposed, energy-intensive industries (both existing and new).
- The remainder of permits would be auctioned. Auction revenue would be divided among the States and Territories on a basis yet to be determined, but in a manner that recognises the differing impacts of the scheme. This revenue could be used to fund assistance measures for others, such as households, regions and small business.

## **Allocation of permits to generators**

If all permits were auctioned, some existing generators would be disadvantaged by the scheme. This is because their costs would rise for every unit of production. For the same level of production their revenues are also likely to rise as wholesale prices increase. However, for some generators, the rise in revenues is likely to be insufficient to offset the increase in their costs (or to offset the reduction in revenue due to a reduction in output).

Black- and brown-coal-fired plants are the most likely generators to be adversely affected by the scheme. Most gas-fired and renewable generators are likely to benefit. Several generating portfolios contain a mixture of likely winners and losers.

Any adverse effects on the operating profits of generators could be reduced through the provision of free permits. The more free permits granted to such firms, the smaller the negative impact on profitability. It would be possible to allocate permits in such a way as to minimise the negative effects on profitability and still have sufficient permits left over to address assistance needs for trade-exposed, energy-intensive industries and other groups.

The free allocation of permits to generators is a wealth-transfer issue, rather than an efficiency issue. So long as the allocation of permits is an *ex ante* decision that is not tied to subsequent emission levels, generators' incentives to take the cost of emissions into account remain intact. For example, some generators might find it more profitable to sell their permits to a new entrant and close down rather than to continue to operate in the same manner as before the emissions trading scheme was introduced.

It is proposed that the value of any free permits allocated to generators would reflect the anticipated reductions in operating profits (and hence asset values) that those existing generators would experience under the scheme, calculated in net present value terms over a 20-year period. Allocation of permits to generators that are likely to be adversely affected by the introduction of the scheme involves a process of estimation. The concept is forward-looking: what would a generator's operating profits have been in the absence of the scheme, and what are they likely to be when the scheme is put in place?

There are many factors that will affect estimates of future profits. The process of estimation is not likely to be simple. It would inevitably involve some level of uncertainty and judgement. It is considered desirable to appoint a group of experts to advise on the methodology and assumptions that should be used in the estimation process. The process for appointing such experts should take into account the views of affected parties.

Comment is sought on whether simpler (but more arbitrary) measures should be used instead of such a detailed estimation approach.

It is proposed that *new* generators should not be eligible to receive a free allocation of permits. This is because a new investor with knowledge of the scheme could build a plant that could operate optimally in the new environment. Stakeholder views are sought on an appropriate definition of a 'new' generator, and other options.

### **Allocation of permits to trade-exposed, energy-intensive industries**

Although many countries are imposing constraints on greenhouse gas emissions, a significant part of the world economy is not currently subject to such constraints and is unlikely to be so in the short to medium term. Taking action in Australia in advance of universal action could affect the competitiveness of Australian trade-exposed, energy-intensive industries if no mechanism were developed to prevent this.

In the extreme, the impact on competitiveness could mean that existing companies in these industries moved offshore, or that Australia missed out on major new investments. The effect on global emissions associated with firms moving offshore is uncertain. A firm could relocate in a country with a similar, higher, or lower emission intensity of its energy supply. It could build a plant that uses energy more or less efficiently than it does in Australia. Therefore, it is impossible to draw firm conclusions about the environmental

effects of relocation. However, the economic effects of relocation are more certain, and they are likely to be negative for Australia. For this reason, it is important to address this issue.

A free allocation of permits is proposed to offset the impacts of increased energy prices on trade-exposed, energy-intensive industries.

It is proposed that new entrant trade-exposed, energy-intensive industries would also be eligible to receive free allocations of permits. This is because the basic rationale for special treatment—that overseas competitors are not subject to equivalent constraints on emissions—is identical for new entrants and existing players. The same applies to major capacity expansions of existing plant.

Until such time as competing nations are subject to equivalent emissions constraints, there is a case for continuing to provide assistance to trade-exposed, energy-intensive firms. Long-term, enforceable promises of permit allocations could be made on that basis. At such time that emissions constraints were applied in competing nations, then permit allocations to trade-exposed, energy-intensive firms could be phased out: the rationale for such assistance would cease to exist. It is anticipated that the Commonwealth Government would need to be involved in any negotiations of such widespread international arrangements, and it would certainly need to agree on any obligations imposed on Australia. If Australia were to be part of any new international regime, the Commonwealth would be required to determine transitional arrangements for Australian industries.

In the event that the Commonwealth Government is not involved in the initial emissions trading scheme, but subsequently takes over its operation or introduces a new scheme, then new assistance arrangements would need to be negotiated with the Commonwealth Government.

### **Assistance to other groups**

It is proposed that remaining permits (that is, those that are not provided to generators or trade-exposed, energy-intensive industries) be auctioned, and that this revenue be returned to the State and Territory Governments. This would provide a source of revenue that could be used to offset the impacts of the scheme on others, which could include households, regions and small business. Stakeholder views are sought on how this revenue could best be distributed and/or used to offset adverse impacts.

## **Institutional arrangements**

New governance arrangements would be required to implement a NETS and support its ongoing operation and administration, its registry system, and its reporting, compliance monitoring and enforcement regime.

In designing the NETS, the clear preference of all State and Territory Governments and stakeholders is for the Commonwealth Government to be involved. Preferred institutional options are based on Commonwealth Government participation and the use of existing institutional arrangements. For example, these institutions could be those created for energy market governance in Australia, that is, the Ministerial Council on Energy, the Australian Energy Market Commission, and the Australian Energy Regulator. However, other options would also be possible, such as the involvement of the National Environment Protection Council and other policy and regulatory agencies.

In the event that the Commonwealth Government chose not to participate in the NETS, State and Territory Governments could establish a new, separate Ministerial Forum, Scheme Developer and Scheme Regulator to govern the scheme. Although there are clear advantages to Commonwealth involvement, operation of a scheme remains feasible without Commonwealth involvement at commencement.

The NETS would require an intergovernmental agreement setting out how the scheme would be established, governed, and implemented consistently across jurisdictions.

A Ministerial Council or Forum, a Scheme Developer and a Scheme Regulator would be established in accordance with the intergovernmental agreement and legislation passed to give effect to the scheme. The Ministerial Council/Forum would provide the final decision-making forum, along with scheme oversight and accountability for the scheme's operations. The Scheme Developer would provide support to the Ministerial Council/Forum to ensure that the scheme's parameters and framework remained efficient, effective and appropriate to the scheme's objectives. The Scheme Regulator would be responsible for day-to-day operation of the scheme.

The Ministerial Council/Forum and Scheme Developer would undertake reviews of particular aspects of the scheme (such as coverage), and a general review of the scheme rules, proposed for 2015. The terms and scope of reviews would be devised with a view to maintaining investor confidence.

## **Emissions monitoring, reporting and verification**

An effective, credible and efficient emissions monitoring, reporting and verification system would be required to underpin the NETS. The system would make reporting mandatory and require reporting (but not necessarily disclosure) at facility level, with stringent verification and auditing protocols.

Ideally, emissions monitoring and reporting would be based on streamlined national processes that are currently under development, and would need to be in place by no later than 1 January 2008 if the NETS were to commence in 2010.

Cost impacts of emissions monitoring and reporting under an emissions trading scheme are expected to be relatively low, as monitoring and reporting will be a requirement of separate national processes. Cost savings are expected to occur through the streamlining of reporting requirements under those national processes, and these would offset the additional requirements for data quality and auditing that would be needed to underpin an emissions trading scheme.

## **Establishment and transition**

There are approximately 3.5 years between the release of this Discussion Paper and a possible early commencement date for the NETS (2010).

Over this period, a number of activities would need to be undertaken to provide for its smooth introduction, including:

- developing and enacting legislation to support the NETS
- establishing and developing the required institutions
- monitoring, reporting and verification of emissions
- designing and implementing permit allocation processes
- defining rules and procedures for offsets projects
- appropriate capacity-building and education of participants and stakeholders.

A number of existing market mechanisms would need to be considered in the detailed design of the NETS and in the options for harmonisation of the various schemes. Given the proposed design of NETS (that is, coverage for caps, eligibility of offsets), it will be possible for the Mandatory Renewable Energy Target (MRET), the Victorian Renewable Energy Target (VRET) and the Queensland 13% Gas Scheme to operate in parallel with the scheme.



The NSW and ACT Greenhouse Gas Abatement Scheme (GGAS) would overlap substantially with capped participants and offsets providers under the NETS. The NSW Government is considering means to prepare for the transition to a NETS.

Ultimately, it will be up to governments that operate these market mechanisms to decide on, and legislate, any modifications or adjustments to the schemes that are appropriate.

## **Linking with international schemes**

The growing recognition of trading as a beneficial approach to curbing greenhouse gas emissions has prompted the development of numerous trading schemes around the world. These schemes vary greatly in their design, and range from compulsory international schemes (such as the EU ETS) to voluntary schemes (such as the Chicago Climate Exchange).

The NETT acknowledge that bilateral linking *might* be desirable in the longer term but agree that the principal objective of designing the NETS should be to establish a strong domestic market.

It is technically feasible to link schemes with different designs as long as some basic conditions are met (such as mutual recognition of the trading unit). However, bilateral linking should be considered only after extensive assessment of the costs and benefits of doing so, and it is an issue more appropriately dealt with by the Commonwealth Government.

However, it is proposed that unilateral linking with the CDM be established from the outset of the scheme. This would allow firms to effectively surrender Certified Emissions Reductions (CERs) towards their domestic obligations while preventing double counting of the reductions. This approach has the advantage of incorporating Australia into the international carbon market while providing an additional 'safety valve' for prices of domestic offset credits and permits. Comment is sought on whether any restrictions on access to such credits are appropriate.

## **Complementary measures**

There are many reasons why government intervention is required to reduce greenhouse gas emissions. An emissions trading scheme addresses one of these reasons: to ensure that investment, production and consumption decisions in the stationary energy sector internalise the costs associated with greenhouse gas emissions.

However, applying a price to greenhouse emissions is only part of the story. Major changes in technologies and behaviour are required across the economy. There are many non-price barriers to abatement, as well as the need for a significant research and development effort.

The scheme design set out in this Discussion Paper is proposed to form part of a broader suite of programs designed to reduce greenhouse gas emissions and operated at the Commonwealth and the State and Territory levels.

## **Next steps**

Written comments are being sought in response to the propositions and issues identified in this Discussion Paper by Friday 22 December and should be posted to:

National Emissions Trading Taskforce Secretariat  
The Cabinet Office  
GPO Box 5341  
SYDNEY NSW 2001

or sent by e-mail to:

[submissions@emissionstrading.net.au](mailto:submissions@emissionstrading.net.au)

All submissions will be made public on the Taskforce web site unless marked confidential ([www.emissionstrading.net.au](http://www.emissionstrading.net.au)).

The Taskforce will arrange stakeholder forums on the Discussion Paper in capital cities. The purpose of these forums is to brief stakeholders on the Discussion Paper, discuss key issues and options for the detailed design of a NETS, and ensure that stakeholders are aware of how they may participate in the process of going forward. Confirmation of dates and venues will be advertised on the Taskforce website.

Stakeholder feedback will inform the decision as to how to progress this proposal further.

# **1 The need for action**

*All Australian governments agree that human-induced climate change is a serious problem that needs to be addressed. Domestic action is desirable to create investment certainty and to place Australia on a smooth transition path to an inevitably carbon-constrained world. A well designed emissions trading scheme may provide a flexible and low-cost way of achieving the required emissions reductions for some sectors. The scheme proposed in this Discussion Paper would need to accommodate multiple priorities, including environmental integrity, investor certainty, transition management, flexibility and equity. For all these reasons, State and Territory Governments agree that an emissions trading scheme starting with the stationary energy sector needs to be considered, and invite the Commonwealth to join with them in this work.*

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## **1.1 The case for a national emissions trading scheme in the stationary energy sector**

State and Territory Governments invite the Commonwealth Government to join with them in considering a national emissions trading scheme (NETS) in the stationary energy sector. There are many reasons why such a policy should be considered.

### **1.1.1 There is a need for investment certainty**

There is a need to reduce the uncertainty faced by investors in energy markets and in energy-intensive industries. Constraints on greenhouse gas emissions are widely regarded as inevitable—it is just a matter of timing. Not knowing when such a constraint will be applied, or in what form, is perceived by many stakeholders as inhibiting decision-making. This Discussion Paper sets out a possible scheme design that, if agreed, would help investors to make informed and rational decisions about their future.

Several submissions in response to the Background Paper commented on the lack of policy certainty in the current environment. For example, the Energy Users Association of Australia stated:

We do recognise the importance of a nationally consistent approach to greenhouse gas emission and that the lack of such a policy creates costs and uncertainties of its own, including for our members. We also believe that it is highly desirable that a national approach to greenhouse focus on achieving emissions reductions at least cost and without damage to our competitiveness (submission 58, p. 1).

Origin Energy stated:

Investors are anticipating a carbon constrained future and have little appetite to invest without a suitable regulatory framework, as the current level of regulatory uncertainty will increase the potential for stranded assets.

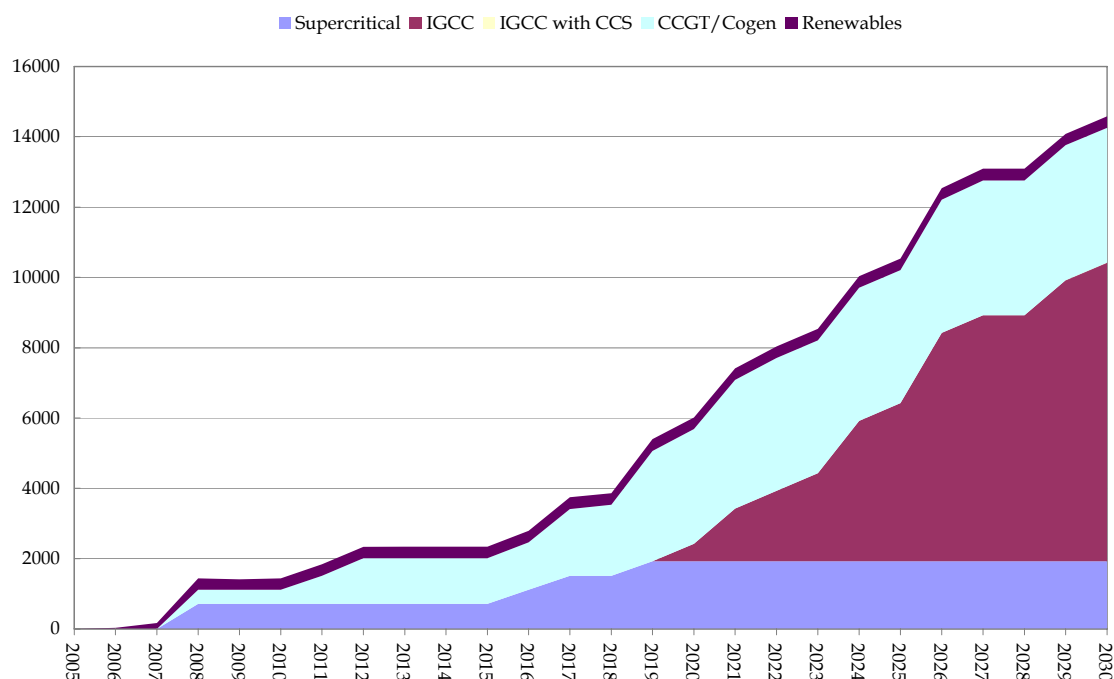
Therefore, in order to apply a carbon constraint in line with goals for long term deep cuts in GHG emissions, Origin supports a national emissions trading scheme as being the appropriate policy response and our strong preference would be a scheme involving the Commonwealth Government. A major objective must be to provide the necessary framework for investors in the energy supply sectors to incorporate the externality of carbon into their investment decision-making process and thereby have enough confidence to commit to the investment, particularly in power generation. This requirement for a carbon signal applies to all technology choices (submission 52, p. 6).

State and Territory Governments are particularly concerned about the effects of investment uncertainty in the electricity industry, potentially contributed to by a lack of international agreement in relation to greenhouse gas emissions trading. Lead times for major new investments in base load plant typically run to several years, and the expected economic life of such plant is at least 40 years. Energy market players are already considering investments for the coming decade. Not knowing what rules will apply to greenhouse gas emissions in the future increases the risks significantly for investors, who are concerned about the risks of very expensive, long-lived assets becoming stranded. In some cases, investors would choose to make completely different types of investments—for example, gas compared with coal—depending on whether or not the cost of emissions were taken into account in the day-to-day operations of the market. The current atmosphere of uncertainty may delay investment and result in higher electricity prices and less reliable supply than if the rules were clearly established in advance.

Estimated increments in Australian electricity generation capacity are shown in Figure 1-1 below. This Figure indicates that significant amounts of new capacity (primarily intermediate and peak) will be needed even before 2020 in a business as usual world. Quickly beyond that date, large increments in base load capacity would be required, and in the absence of any carbon price signal, would be predominantly coal-fired and relatively emissions-intensive. Arrangements need to be in place to guide investment decisions well in advance of requirements for new capacity, or else decisions will be ‘locked in’ for technologies that are likely to be unsuitable in the longer term in a carbon constrained world.

Investment uncertainty is also an important issue for trade-exposed, energy-intensive industries. The form and stringency of constraints on emissions could potentially have a significant impact on investment decisions.

**Figure 1-1: New generation capacity in Australia, 2005—2030**



IGCC: Integrated Gasification Combined Cycle

CCS: Carbon Capture and Storage

CCGT: Combined Cycle Gas Turbine

Cogen: Cogeneration

Source: MMA (2006), *Impacts of a National Emissions Trading Scheme on Australia's Electricity Markets*.

### 1.1.2 There is a requirement for smooth adjustment paths

Imposing a constraint on emissions in the near future may allow Australia to follow a smoother adjustment path to a carbon-constrained economy. The current weight of scientific evidence indicates that substantial reductions in emissions are required before the middle of the century. Delaying action means that Australia faces sharper reductions in emissions with higher total costs and more significant impacts on the economy than if transition were managed in a more gradual way.

The recent report by the Australian Business Roundtable on Climate Change, representing BP, Insurance Australia Group, Origin Energy, Swiss Re, Visy, Westpac and the Australian Conservation Foundation, found that the costs associated with delayed action were significant.<sup>9</sup>

<sup>9</sup> Australian Business Roundtable on Climate Change, April 2006, *The Business Case for Early Action*. See [www.businessroundtable.com.au](http://www.businessroundtable.com.au)

A recent report by the Australian Gas Light Company (AGL), Frontier Economics and WWF also found that significant reductions in emissions were possible by 2030 with existing technologies, and that the costs of such action were affordable.<sup>10</sup>

### **1.1.3 Domestic action forms part of a credible international negotiating position**

Domestic action forms part of a persuasive international position on climate change. Global action on climate change is required and should arguably be actively encouraged by Australia, given the costs to our own economy, communities and ecosystems that climate change entails. As responsible global citizens, many Australians are also concerned about the effects of climate change on others, particularly developing countries. Developing countries have contributed least to the problem to date. They are likely to bear the greatest portion of its costs, and are least equipped to do so.

As a medium-sized world power, Australia has several opportunities to seek to influence global outcomes in multilateral negotiations. Australia has the political, technical and economic capability to lead the development of solutions, and has ratified the United Nations Framework Convention on Climate Change (UNFCCC). Reducing emissions domestically may allow Australia to pursue these opportunities with greater credibility.

### **1.1.4 An incentive is needed to deploy abatement technology**

In the absence of a price on emissions, there is little incentive to deploy existing or new technologies to reduce greenhouse gases. Although an emissions trading scheme is not a substitute for technology development policy (a strong focus of the Commonwealth Government and State and Territory Governments), it is an important element in ensuring that new technologies are subsequently deployed. An emissions trading scheme can play an important role in commercialisation of new and existing technologies, and has a strong synergistic relationship with existing research and development goals—see Chapter 13.

The box below outlines the important complementary role that emissions trading could play in stimulating investment in, for example, clean coal technologies, and accelerating their mass deployment.

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<sup>10</sup> AGL, Frontier Economics, WWF, 2006, *Options for Moving Towards a Lower Emissions Future*. See <http://wwf.org.au/publications/lower-emission-future/>

### **Deploying clean coal technologies – the complementary role of emissions trading**

Internationally, coal is expected to continue to be the dominant fuel source for electricity generation to at least 2030 due to its security of supply, widespread availability and cost competitiveness. Clean coal technologies are being developed that have the potential to significantly reduce the greenhouse gas emissions from coal-fired electricity generation to near-zero levels.

An effective research, development and demonstration (RD&D) programme is necessary to support the early stages of innovation and help develop and demonstrate clean coal technologies. Queensland has now committed over \$300 million, and Victoria around \$80 million, to technology-related RD&D. Both those programmes dovetail with the Commonwealth Government's \$500 million Low Emissions Technology Demonstration Fund (LETDF). The Australian black coal mining industry also recently committed to provide up to \$300 million over the next five years to work with the electricity generation industry to demonstrate technologies for reducing greenhouse gas emissions from coal fired power stations.

These Government and industry programmes are designed to help new technologies get to a stage when they could be commercially deployed on a wider scale. However, such technologies are unlikely to be commercially deployed in the absence of a price on greenhouse gas emissions. An emissions trading scheme could help bridge this 'deployment cost' gap. It could help create a market environment in which it becomes commercially attractive to install abatement technology, such as carbon capture and storage. For electricity generation, such technology would never be viable in its own right without substantial Government subsidies.

Emissions trading could play a valuable complementary role to an effective RD&D programme for clean coal, as well as other abatement technologies. The carbon price from an emission trading scheme is expected to provide incentives for businesses to switch to low emissions coal technologies that are currently available, but require additional economic support. For example, emissions trading would provide incentives for existing coal generators to increase their thermal efficiency and thereby reduce CO<sub>2</sub> emissions. It could also stimulate investment in, and accelerate the deployment of, prospective clean coal technologies that are currently at the experimental and demonstration phase. They include technologies such as black coal integrated gasification combined cycle and brown coal integrated dewatered gasification combined cycle, combined with the ability to undertake carbon capture and storage.

### **1.1.5 Action is affordable**

Finally, economic modelling undertaken to date indicates that it is possible to reduce greenhouse emissions in an economically manageable way. The inherent flexibility of emissions trading is a major reason for this. Based on preliminary modelling undertaken for the NETT, strong economic growth appears possible while also reducing greenhouse gas emissions. A common argument against domestic action is that it could seriously damage the international competitiveness of trade-exposed, energy-intensive industries.

However, the measures proposed in this Discussion Paper could help to prevent that outcome. Mechanisms have been included in the proposed scheme design to help protect the international competitiveness of such industries although stakeholder feedback on their likely effectiveness is sought. Similarly, it is possible to assist others that could be adversely affected by the scheme. The nature of an emissions trading scheme creates an inbuilt source of value to pursue those goals.

Of course, there are risks associated with taking domestic action at a time when the timing and form of international action is uncertain. Significant reductions in emissions in the short term are not proposed. Australia will need to move in step with the international community towards large cuts in emissions. However, acting now means that Australia would be set on the path towards the emissions reductions that will inevitably be required. Delaying action may impose higher costs on the Australian economy—and our international competitiveness—because more abrupt reductions in emissions could disrupt the economy.

## **1.2 The problem of climate change**

The risks of climate change caused by human activities are well documented. In 2003 the Australian Greenhouse Office (AGO) released a report<sup>11</sup> on climate change impacts for Australia. The AGO summarised the contributors to Australia's vulnerability to climate change as follows:

Australia is vulnerable to changes in temperature and precipitation projected for the next 50 to 100 years, because it already has extensive arid and semi-arid areas, relatively high rainfall variability from year to year, and existing pressures on water supply in many areas.

In addition, vulnerability arises due to high fire risk, Australian ecosystems sensitive to climate change, and invasion by exotic animal and plant species introduced by human activity.

Australia also has a high concentration of population in coastal areas, an economy strongly dependent on world commodity prices, tourism dependent on the health of the Great Barrier Reef and other fragile ecosystems, and economically and socially disadvantaged groups of people.

A report by CSIRO, prepared for the Australian Business Roundtable on Climate Change, reported on the implications of different ranges of global temperature rise for natural ecosystems, cropping, forestry and livestock, water resources, public health and settlements and infrastructure.<sup>12</sup> Reported implications of climate change include bleaching of the

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<sup>11</sup> Pittock B (ed.) 2003, *Climate Change—An Australian Guide to the Science and Potential Impacts*, Australian Greenhouse Office, Canberra

<sup>12</sup> Preston BL, Jones RN 2006, *Climate Change Impacts on Australia and the Benefits of Early Action to Reduce Global Greenhouse Gas Emissions*, Consultancy Report for the Australian Business Council on Climate Change, CSIRO Marine and Atmospheric Research, Victoria



Great Barrier Reef (possibly to the point of destruction), reduction of snow cover in the Australian Alps, and loss of habitat for many vertebrate and invertebrate species in northern and south-east Australia. Australia's agricultural sector is likely to be affected by reduced rainfall, a greater likelihood of extreme weather events (droughts, floods, cyclones and storms), reductions in pasture quality, and an increase in the populations of pests such as the Queensland fruit fly, the light brown apple moth and ticks. Substantial reductions in rainfall (particularly in winter) are predicted for Victoria, South Australia and Western Australia over the 21st Century. The nature of the changes in other regions is more uncertain. Health implications, particularly for older Australians and remote Aboriginal communities, were also highlighted.

Significant negative impacts of climate change on the rest of the world during this century are also predicted. Table 1-1 below provides a summary of likely global impacts prepared by Professor Stephen Schneider, who is a Professor in the Department of Biological Sciences, a Senior Fellow at the Center for Environment Science and Policy of the Institute for International Studies, and Professor by Courtesy in the Department of Civil and Environmental Engineering at Stanford University since September, 1992. Professor Schneider is currently a Thinker in Residence for the South Australian Government.

**Table 1-1: Projected effects of global warming during the 21<sup>st</sup> Century**

<b>Projected Effect</b>	<b>Probability estimate</b>	<b>Examples of Projected Impacts with high confidence of occurrence in at least some areas (67 – 95% probability)</b>
Higher maximum temperatures, more hot days and heat waves over nearly all land areas	Very likely (90-99%)	Increased deaths and serious illness in older age groups and urban poor. Increased heat stress in livestock and wildlife. Shift in tourist destinations. Increased risk of damage to a number of crops Increased electric cooling demand and reduced energy supply reliability.
Higher minimum temperatures, fewer cold days, frost days and cold waves over nearly all land areas	Very likely (90-99%)	Decreased cold-related human morbidity and mortality. Decreased risk of damage to a number of crops, and increased risk to others. Extended range and activity of some pest and disease vectors. Reduced heating energy demand.

**Table 1-2: Projected effects of global warming during the 21<sup>st</sup> Century (continued)**

<b>Projected Effect</b>	<b>Probability estimate</b>	<b>Examples of Projected Impacts with high confidence of occurrence in at least some areas (67 – 95% probability)</b>
More intense precipitation events	Very likely (90-99%) over many areas	Increased flood, landslide, avalanche, and mudslide damage. Increased soil erosion. Increased flood runoff. Increasing recharge of some floodplain aquifers. Increased pressure on government and private flood insurance systems and disaster relief.
Increased summer drying over most mid-latitude continental interiors and associated risk of drought	Likely (67-90%)	Decreased crop yields. Increased damage to building foundations caused by ground shrinkage. Decreased water resource quantity and quality Increased risk of forest fire.
Increase in tropical cyclone peak wind intensities, mean and peak precipitation intensities	Likely (67-90%) over some areas	Increased risks to human life, risk of infectious disease epidemics and many other risks. Increased coastal erosion and damage to coastal buildings and infrastructure. Increased damage to coastal ecosystems such as coral reefs and mangroves.
Intensified droughts and floods associated with El Niño events in many different regions	Likely (67-90%)	Decreased agricultural and rangeland productivity in drought- and flood-prone regions. Decreased hydropower potential in drought-prone regions.
Increased Asian summer monsoon precipitation variability	Likely (67-90%)	Increase in flood and drought magnitude and damages in temperate and tropical Asia.
Increased intensity of mid-latitude storms	Uncertain (current models disagree)	Increased risks to human life and health. Increased property and infrastructure losses. Increased damage to coastal ecosystems.

Source: Schneider, S. (Adapted from IPCC 2001), see [http://stephenschneider.stanford.edu/Climate/Climate\\_Impacts/CliImpFrameset.html](http://stephenschneider.stanford.edu/Climate/Climate_Impacts/CliImpFrameset.html)

### **1.3 Reducing emissions significantly by the middle of the century**

State and Territory Governments are seeking stakeholder views on developing policy that puts Australia on a pathway to reduce our emissions by around 60% compared to 2000 levels by the middle of the century. This would be an economy-wide goal rather than a sector-specific target—the emissions trading proposals in this paper only apply to the stationary energy sector.

This long-term direction is consistent with a number of other targets announced by governments around the world. It is consistent with targets announced by the New South Wales and South Australian Governments and other governments overseas. Statements by Commonwealth Ministers over time suggest that the Commonwealth also recognises the need for significant reductions in emissions in the longer term. For example, the Commonwealth Minister for the Environment and Heritage, Senator Campbell has stated:

The globe needs to reduce its emissions by 50% by around halfway through this century. Australians need to do that as well, it's as simple as that. ...[I]t's not likely that Australia's emissions will go down at a greater rate than the rest of the world's. The whole world has ... got to do this together. Australia's got to play a significant part in that. ... I hope that Australia can beat the whole world in this policy area. That's my commitment, that's what I want to do. But I think we have to stabilise our emissions over the next 20 odd years and have them reduce by 50% by roughly halfway through this century. 50 to 60% reductions by the year '50 or '60.<sup>13</sup>

The desire to reduce Australian emissions by around 60% from 2000 levels by the middle of the century is based on scenarios of the reductions required to avoid dangerous 'dangerous anthropogenic interference' in the world's climate. As noted by CSIRO:

Greenhouse gas emissions are a useful benchmark for measuring Australia's efforts in addressing the climate change challenge. While a number of institutions have advocated for global GHG stabilisation levels, ... no one country can achieve such a target through individual action. However, Australia can take measures to achieve reductions in national emissions, and in so doing, contribute to other international efforts to curb GHG emissions and, subsequently, GHG stabilisation. Although neither the international scientific nor policy communities have come to an agreement regarding what an appropriate GHG stabilisation level should be, significant emissions reductions over the next several decades would also preserve future options in the choice of a stabilisation level. Should the climate prove insensitive to anthropogenic GHG emissions, future commitments to mitigation can be made less stringent. Yet, more conservative thresholds would remain feasible should the more pessimistic projections of climate change and its impacts prevail.

Although the pursuit of emissions reductions of 60% or more cannot be translated directly into a specific stabilisation target, this emissions target does have its origins in the analysis of different stabilisation pathways, particularly the 550 ppmv stabilisation target which ... is roughly the upper limit for atmospheric GHG concentrations that avoid DAI [dangerous anthropogenic interference].<sup>14</sup>

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<sup>13</sup> Transcript of interview with Janine Cohen (ABC), 13 February 2006, <http://www.abc.net.au/4corners/content/2006/s1566857.htm>

<sup>14</sup> Preston BL, Jones RN, 2006, *Climate Change Impacts on Australia and the Benefits of Early Action to Reduce Global Greenhouse Gas Emissions*, Consultancy Report for the Australian Business Roundtable on Climate Change, CSIRO Marine and Atmospheric Research, Victoria, pp. 16-17

None of the submissions or comments received during the consultation process to date has disputed the need for large-scale reductions in emissions by the middle of the century. For example, the Plastics and Chemicals Industry Association stated:

- If ‘atmospheric’ carbon dioxide (CO<sub>2</sub>) and other GHG levels that most science based opinion consider to be sustainable are to be achieved, a dramatic reduction in the global emissions must be achieved in the longer term
- A realistic period for the achievement for these levels is about 50 years, given existing infrastructure and the anticipated opportunities for technological developments (submission 11, p. 2).

It appears that there is widespread community acceptance of the need for global action on climate change, and for Australia to take its part in international efforts.

Placing Australia on a path to reducing emissions by around 60% from 2000 levels by the middle of the century has important implications for nearer-term policy development. Major new investments in the electricity sector in particular will be required in the coming decades. These are likely to be still operating by 2050. It is important to send a signal now to ensure that likely future emissions constraints are taken into account when investments are made in such long-lived assets.

*Stakeholder views are sought on developing policy that places Australia on a path towards reducing national greenhouse gas emissions by around 60% compared to 2000 levels by the middle of the century.*

## **1.4 Why emissions trading?**

The need to reduce greenhouse gas emissions and reduce the risks of climate change has been accepted by all levels of government in Australia. The Commonwealth Government and all State and Territory Governments already have policies in place that contribute to this goal.

Emissions trading can play an important role in the suite of policy measures needed for the future. Emissions trading is a practical, flexible and relatively low-cost means of achieving an emissions target for some sectors, potentially including the stationary energy sector. Emissions trading appears to be particularly suited to sectors where emissions can be estimated and reported accurately at low cost, where there is a reasonable number of emitters, and where the transaction costs of covering those emitters are not unreasonably high. Most importantly, emissions trading can encourage abatement activities in markets where price signals are likely to have an influence. Investments and dispatch in electricity markets are prime examples of the sorts of instances in which emissions trading is likely to be most effective.

While a number of different potential models for emissions trading exist, the collection of cap and trade models are widely preferred as they better guarantee emissions reductions while the costs can be capped. This is also the basic design of the EU emissions trading scheme and is therefore likely to better facilitate international integration in the future.

**How does a cap and trade emissions trading scheme work?**

The essential elements of an emissions trading scheme are that:

- emissions are capped at some level in each period
- permits to emit greenhouse gases are issued for each period
- there is a penalty for non-compliance which underpins a value for emissions
- participants can trade these permits among themselves.

The price of permits is not set by governments – rather, it emerges from the market, subject to any upper limit set by governments to constrain economic impacts. Firms are likely to be willing to pay for permits if their internal costs of abatement are higher than the price of permits. Firms would be willing to sell permits if the revenue received from selling permits exceeds the profits from using the permits.

One of the great strengths of an emissions trading scheme is that it is technology-neutral (that is, it does not select preferred technologies). It allows the market to seek out the lowest-cost ways of achieving any particular emissions cap. It does not rely on omniscient governments directing investments and abatement activities through more traditional ‘command and control’ regulation, or through industry- or technology-specific subsidies. As noted by A3P (the Australian Plantation Products and Paper Industry Council):

If Governments determine that measures are needed to promote immediate abatement action, the issue is not well suited to a ‘command and control’ approach or one that seeks to pick winners. A market approach, such as emissions trading, where anyone may choose to participate and solutions can be pursued on the basis of their perceived effectiveness is more suitable.

Market measures also enable businesses to discover the cost of action and manage their obligations in a commercial manner. Importantly, if the market approach involves long term property rights, markets will develop for the long term rights, enabling businesses to plan and manage the risk involved in long term investments.

Market measures, including emissions trading, are a preferred policy response to climate change than ‘command and control’ measures (submission 64, p. 3).

Another strength of an emissions trading scheme compared with alternative measures is that it has an inbuilt mechanism for providing adjustment assistance. The scheme caps emission permit numbers and, therefore, permits to emit greenhouse gases have value. The way in which this initial value is allocated could be used to ensure that those who are likely to be most adversely affected by the introduction of the scheme are helped. This is discussed in more detail in Chapter 7.

One of the 10 design propositions agreed and announced by First Ministers in March 2005 was that the scheme be based on a cap and trade design. The arguments for a cap and trade scheme design compared with alternative models are not revisited here. This Discussion Paper sets out in more detail a possible design of a cap and trade emissions trading scheme; it does not investigate in detail alternative scheme designs, such as a baseline and credit emissions trading scheme. That said, however, elements of alternative scheme designs have been incorporated where appropriate. For example, arrangements for offsets would, by necessity, largely follow a baseline and credit model (see Chapter 5).

## **1.5 Objectives of scheme design**

In designing an emissions trading scheme for Australia, there are a number of objectives to take into account. These include:

- **Environmental integrity:** The purpose of the emissions trading scheme is to reduce greenhouse gas emissions. The environmental integrity of the scheme is therefore of central importance in scheme design.
- **Investor certainty:** One of the main drivers for considering an emissions trading scheme is to improve certainty for investors, particularly for investors in long-lived capital in energy markets.
- **Minimising impacts on the economy:** constraining greenhouse gas emissions in the stationary energy sector is a significant economic change, which must be managed carefully. Economic impacts would be minimised if the scheme is constructed as efficiently as possible, promotes least cost reductions in emissions, and caps the cost of compliance. Also, until such time as there is widespread international action on emissions reductions, the competitiveness of Australian trade-exposed industries must be protected.
- **Flexibility:** The future is uncertain. The scheme needs to be flexible in the face of new information emerging from climate change science, international obligations, and the costs and nature of new technologies.
- **Equity:** The design must provide the means to assist those most adversely affected by reducing emissions through the scheme.

There are many elements of the scheme design set out in this Discussion Paper that have an influence on these goals. This Discussion Paper sets out how they have been taken into account, and Chapter 10 summarises how the various elements seek to strike a balance between them.

## **1.6 Commonwealth Government involvement**

Numerous stakeholders have identified the benefits of Commonwealth involvement in any NETS. State and Territory Governments agree that Commonwealth involvement would be preferable, and they invite the Commonwealth to join with them in considering the scheme design set out in this Discussion Paper.

The scheme design set out in this Discussion Paper could be implemented with or without Commonwealth involvement. It is a proposal put forward in the national interest.

*State and Territory Governments invite the Commonwealth to join with them in considering the scheme design set out in this Discussion Paper.*

## **1.7 Potential scheme start**

The scheme could commence as early as 2010. Some stakeholders consider that it would be in Australia's interest to have an early start to the scheme, for reasons that include:

- It allows for a 'soft start' and a smooth transition to more stringent abatement in the future. Since Australia is on track to meet its Kyoto target, emissions reductions targets in the earliest years of the scheme could be modest.
- A start around 2010 is considered to provide sufficient time for the scheme to be implemented. This would involve passing legislation, regulations and detailed rules. New institutions may need to be created. The experience with the EU ETS suggests that it is critical to have the underpinning emissions monitoring and reporting systems in place and working well before a trading scheme commences. A 2010 start date allows time for these processes to occur in a manner that allows for detailed stakeholder consultation.
- The scheme should preferably be in place in advance of requirements for new base load generation capacity. This is because the lead-times for such investments are long – around six years or more for a new coal-fired plant. It is important that a credible scheme is in place early, to influence these planning decisions.

Stakeholder views are sought on when it may be preferable to start emissions trading in Australia.

It is proposed that the scheme would initially cover stationary energy (as identified in one of the 10 key design propositions set out by First Ministers). State and Territory Governments have long been responsible for policy in this sector. Investors await signals from these Governments as to the policy framework that would apply to new investments in the energy sector. While it would be preferable for the Commonwealth to be involved

in the implementation of the scheme, the imperatives of energy supply planning mean that a scheme established by State and Territory Governments alone could provide valuable certainty to investors in this industry.

The design of the NETS has been developed such that additional sectors could be added over time.

## **1.8 Outline of this Discussion Paper**

The scheme design set out in this Discussion Paper is based on the 10 key design propositions agreed on by First Ministers in March 2005 (see 'Background to this Discussion Paper').

The proposed coverage of the scheme is described in Chapter 2. This sets out which parts of the stationary energy sector are to become liable parties under the scheme, and also the process by which coverage could be broadened over time.

Chapter 3 deals with cap-setting and examines the role of banking and borrowing. Chapter 4 sets out proposed arrangements for scheme penalties, and examines the issue of whether a 'make good' provision should be included in addition to a financial penalty.

Proposed arrangements for offsets are described in Chapter 5.

Chapter 6 sets out the estimated impacts of the *indicative* caps and gateways. It describes the modelling process used to provide 'order of magnitude' impacts, and summarises the key results. The modelling assumptions, method and results are set out in more detail in the separate Modelling Report. Comment is sought on all aspects of this modelling process.

The nature of permits, and the proposed approaches to permit allocation and providing adjustment assistance are set out in Chapter 7.

Chapter 8 sets out the institutional arrangements that would need to sit behind the implementation of any new scheme. One of the most important elements of the new arrangements is a robust monitoring and reporting regime. Issues associated with monitoring and reporting are discussed in Chapter 9.

As noted above, the scheme design must accommodate multiple objectives. A summary of how the scheme design seeks to meet these objectives is provided in Chapter 10.

Issues relating to the transition to a NETS, including harmonisation with, or transition from, existing schemes, are discussed in Chapter 11. Chapter 12 deals with links to international schemes. Complementary measures are discussed in Chapter 13.

Finally, the process of public consultation to inform the decision as to whether to progress this proposal further is set out in Chapter 14.

Stakeholders are invited to comment on all aspects of the scheme design set out in this Discussion Paper.



## 2 Coverage

*This Chapter describes the proposed coverage of the NETS by setting out proposals as to which sectors would be liable for their emissions and which gases would be covered under the scheme.*

*Comment is sought on a preferred option for scheme coverage, including whether the scheme should commence with coverage of electricity generation only (above a 30 MWe capacity). Other sources of stationary energy emissions above a 25-kt CO<sub>2</sub>-e a year threshold are proposed to be included once the scheme has been in operation for 5 years. Comment is also sought on an alternative option under which the scheme would commence with coverage of all emissions described above.*

*It is proposed also to cover gas retailers as a point of liability in respect of the imputed emissions from use of the gas they supply to customers, and to cover pipeline operators in respect of fugitive emissions from gas transmission and distribution systems.*

*Other sources of fugitive emissions, and emissions arising from petroleum refining, industrial processes, transport, waste, agriculture and land use/forestry activities would be excluded from liability under the proposed scheme. However, businesses able to reduce emissions in these sectors (or undertake sequestration) may be eligible to create offset credits.*

*It is proposed that parties with emissions liabilities monitor, report and verify their emissions of carbon dioxide, methane and nitrous oxide. Offset credit providers may, however, create offsets by reducing emissions of either these gases or synthetic greenhouse gases.*

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### 2.1 Sectors to be covered by the NETS

In March 2005, the State and Territory Governments endorsed the proposition that the stationary energy sector be initially considered for a NETS.

Governments also endorsed the proposal that coverage of fugitive emissions be further investigated, because fugitive emissions are closely linked to the production and transport of black coal, gas and oil.

State and Territory Governments noted that the scheme could subsequently be expanded to cover other sectors, such as transport.

Since that time, further investigation has been undertaken on the appropriate initial coverage of the scheme. This Chapter sets out the results of that analysis.

## 2.2 Coverage of stationary energy emissions

It is proposed that the NETS commence by covering a subset of stationary energy emissions. The following sections provide information on what constitute stationary energy emissions and set out the proposed approach to coverage.

### 2.2.1 Emissions from the stationary energy sector

Stationary energy<sup>15</sup> as reported in the National Greenhouse Gas Inventory (NGGI) accounted for 50%<sup>16</sup> of Australian greenhouse gas emissions in 2004, or 280 million tonnes out of a total of 565 million tonnes of carbon dioxide-equivalent (CO<sub>2</sub>-e) emissions (see Figure 2-1).

Of this, 70% arose from electricity generation, 15% from manufacturing and construction, and 8% from other energy industries such as petroleum refining, coke manufacture and coal mining.<sup>17</sup> The remaining 7% arose from direct fuel combustion in the commercial and household sectors, and from non-transport fuel use in primary industries, mobile sources and military vehicles.

Approximately 70% of stationary energy emissions result from the combustion of solid fuel, 18% from gas, and 12% from liquid fuel. Solid fuel is primarily used by large facilities. Liquid fuel is mainly used in oil refineries and by mobile sources that have been defined as 'stationary energy' for NGGI purposes.<sup>18</sup> Gas use is spread throughout the economy, ranging from use as a fuel in large power stations through to small-scale domestic heating and cooking.

Australia's total emissions from all sources are projected to increase to 108% of the 1990 emissions level by 2010, and to 122% by 2020. However, stationary energy emissions are projected to be 146% of 1990 levels by 2010 and 170% by 2020.<sup>19</sup>

Stationary energy emissions will therefore be growing rapidly in absolute terms and as a proportion of Australia's total emissions profile for the foreseeable future.

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<sup>15</sup> 'Stationary energy' means the combustion of fuel for energy purposes in all uses other than transport. As such, it includes electricity generation, oil refineries, and direct combustion of fuels in the manufacturing, commercial, household and primary industry sectors.

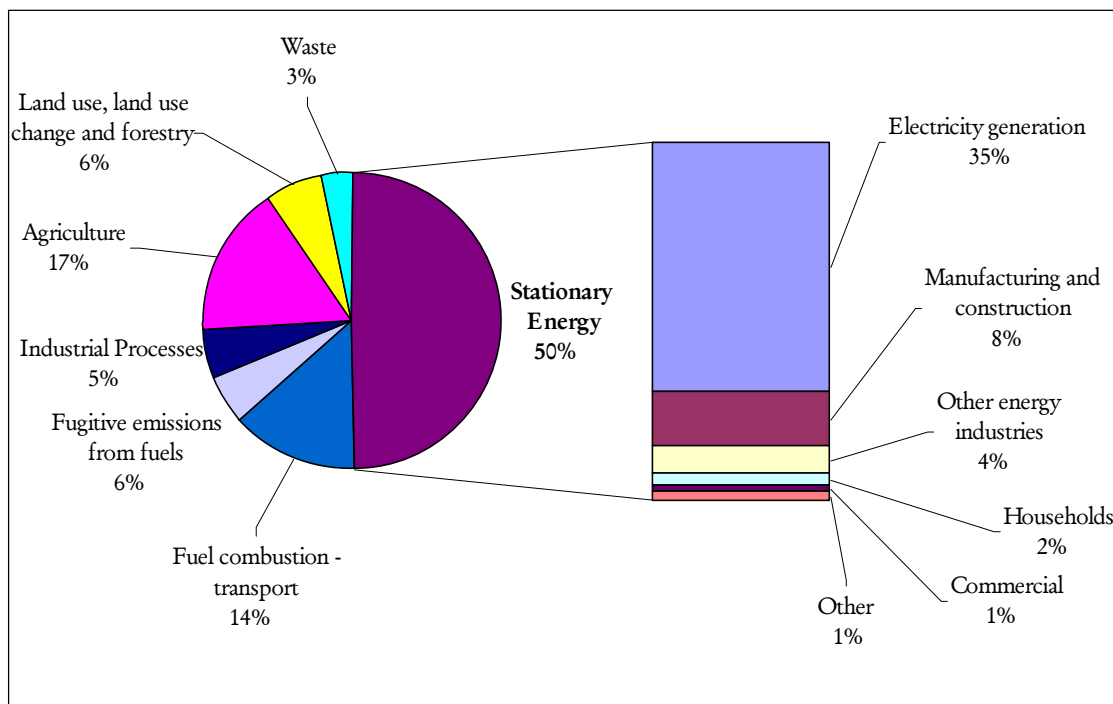
<sup>16</sup> This is the average for Australia. Stationary energy emissions vary from State to State, ranging from 23% of GHG emissions in the Northern Territory to 66% in Victoria. State and Territory inventories for 2004 are available from the AGO.

<sup>17</sup> These are national figures. Figures for individual jurisdictions are available from the AGO or online at <http://www.greenhouse.gov.au/inventory/stateinv/index.html>

<sup>18</sup> For example, lawn-mowers; fishing boats; farm, forestry, mining and construction equipment; and military fuel use.

<sup>19</sup> AGO, 2005: *Tracking to the Kyoto Target 2005*, pp. 17 and 20. Actual projections are: 585 Mt total and 285 Mt stationary energy in 2010; 664 Mt total and 333 Mt stationary energy in 2020.

**Figure 2-1: Total Australian emissions 2004 (565 Mt), showing stationary energy components**



Source: AGO, *National Greenhouse Gas Inventory* 2004.

Note: Figures do not add up to 100% due to rounding.

### 2.2.2 Scope of coverage

Ideally, a NETS should encourage a least-cost pattern of abatement activities to meet a national emissions target across all emitting sectors. It is widely considered that coverage should be as broad as possible.

However, this preference for broad coverage is tempered by considerations of practicability and workability. For example, the administrative burdens of compliance must not outweigh the benefits of incentives to reduce emissions, and transitional impacts need to be manageable.

State and Territory Governments in 2005 confirmed (as part of the ten design propositions) that initially **electricity generation** would be considered for the NETS, and undertook to further investigate the following elements of stationary energy for possible coverage:

- combustion of fuel in non-transport uses
- petroleum refining
- gas processing.<sup>20</sup>

<sup>20</sup> Gas processing emissions are a mixture of combustion emissions and fugitive emissions. Fugitive emissions from gas processing are discussed in Section 2.3 'Coverage of fugitive emissions'.

State and Territory Governments have assessed each of the stationary energy emissions sources for inclusion in the NETS in terms of the criteria set out in Table 2-1.

**Table 2-1: Criteria for assessing emissions sources for coverage**

Criterion	Explanation of criterion
Efficiency (allocative and dynamic)	The scope of coverage should encourage a least-cost pattern of abatement activities to meet any national emissions target. The sequence and timing of investments in new abatement technologies should minimise costs over time.
Competitive neutrality between fuels	A particular sub-criterion of efficiency and equity. By attaching a price to emissions and covering subsets of fuels, emissions trading will change relative prices.
Effectiveness in reducing emissions	The scope for achieving emissions reductions in the covered sectors must be considered.
Avoiding market power in the permit market	A requirement of an efficient market is that no one buyer or seller has market power; otherwise failures can occur in the permit market, resulting in permit prices being significantly above the marginal cost of abatement. The scope of the scheme must be broad enough to avoid problems of this kind.
Administrative simplicity, including: <ul style="list-style-type: none"> <li>• practicability</li> <li>• workability</li> <li>• ability to meet time frames</li> </ul>	Proposed coverage needs to be technically achievable, economically viable with regard to transaction costs, and capable of being put in place with reasonable certainty over timing. Relevant matters include: <ul style="list-style-type: none"> <li>• ability to monitor and report emissions to a high degree of accuracy at a reasonable cost</li> <li>• availability of a suitable point of liability.</li> </ul>
Equity considerations	The fairness implications of different coverage options need to be considered from the point of view of the covered participants and their customers.

### 2.2.3 Should stationary energy coverage be phased in?

Although it would be preferable to commence a scheme with all sectors identified for coverage included from the outset, on the grounds of practicability a number of stakeholders have suggested a phased approach, beginning with electricity generation. Origin Energy stated:

We suggest that the scheme could initially cover the electricity generation sector. Following a review of its operation, coverage should be broadened to include the remainder of the stationary energy sector, in addition to fugitive emissions. The scheme should be progressively broadened to eventually cover all sectors to gain maximum efficiency, whilst ensuring acceptable transactional costs. (submission 52, p. 3)

The Australian Financial Markets Association drew an analogy with the introduction of retail contestability:

The retail electricity market was implemented in staged tranches, starting with the largest customers. This allowed for the development of market infrastructure, skills and processes with a relatively small number of large and well informed customers. This then lowered the transaction costs and complexity as the larger number of smaller customers were introduced into the market over time.

AFMA [Australian Financial Markets Association] submits that since it is clear that ultimately some form of emissions market will develop, a faster start with a known design is preferred to a delayed start on a broader base. This is because we feel that the benefits of regulatory certainty and experience will outweigh the cost of having—at least initially—a narrower market with lower volumes. (submission 51, p.11)

Considerations of efficiency, competitive neutrality and administrative simplicity apply to the question of whether other non-electricity stationary energy emissions sources should be included at a later date under a phased approach.

The advantages of delaying the coverage of gas, coal and oil emissions, rather than including these emissions from the start of the scheme, relate principally to administrative simplicity. For example:

- Liability for gas, coal and oil is more complicated than for electricity, and monitoring and reporting and auditing systems need to be able to differentiate between stationary energy emissions and industrial process emissions for these fuels.
- The rules for the NETS may need fine-tuning in the early days of their operation. Having liability confined to a smaller group of firms would limit any disruption caused by such fine-tuning.
- A delay in coverage allows governments to assess impacts and the suitability of adjustment assistance mechanisms, and to learn from any perceived successes or shortcomings.

However, phased coverage involves some risks. Potential problems, and how they could be addressed, are discussed below.

A phased approach requires the cap to be altered and a new batch of permits to be allocated each time scheme coverage is expanded. It may be difficult to ensure that this does not have a disruptive effect on permit prices (at least in the short term). This can be addressed by giving participants adequate notice of changes to scheme coverage and of the likely changes to the cap at that time.

Phased coverage might also prolong efforts to avoid coverage completely, which initial blanket coverage might forestall. Although this is potentially an issue, there would be considerable pressure from other quarters to expand coverage.

Another issue is that phased coverage might encourage an inefficient degree of switching away from electricity towards direct use of gas, coal and oil. Although this may not necessarily be a problem from the point of view of reducing emissions—particularly with a switch to more direct use of gas—it nonetheless means that the resulting investment pattern may not meet environmental goals at least cost. This can largely be addressed by ensuring that the period of time between covering electricity generation and covering other forms of stationary energy is not long enough to encourage such behaviour—say no more than 5 years.

A final issue is that phased coverage excludes some major participants from the permit market for a period, increasing the risks of market power in the permit market. However, it is considered that the number of participants in the electricity sector, along with the potential to use offsets (including some international offsets) should avoid this problem. In the NEM in the eastern States, and now in the SWIS<sup>21</sup> in WA, governments have taken the view that there are sufficient players to create a reasonably efficient **electricity** market. There is no reason why competition in the market for **permits** would be any less vigorous.

## 2.2.4 Proposed coverage

### *Preferred option*

It is proposed that the preferred option for scheme coverage is that **the scheme initially covers electricity generation emissions only**, followed by coverage of other stationary combustion of gas, coal, oil and other fossil fuels 5 years after scheme commencement.

In addition to the advantages identified in Section 2.2.3, there are several further reasons to adopt this approach:

- the electricity generation sector appears to offer the greatest scope for abatement of greenhouse gas emissions within the stationary energy sector

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<sup>21</sup> A wholesale electricity market was established based on the WA South-West Interconnected System (SWIS) in 2006.

- in some instances, the sector is already required to monitor and report its emissions, and is able to do so with a high degree of accuracy
- there will be a need for significant investment in new generation plant over the next two decades—an early price signal will encourage the deployment of lower-emitting technologies.

A number of alternative possibilities<sup>22</sup> for the type and level of a threshold for electricity generation have been assessed. It is proposed that a threshold of 30 MWe (as the nameplate rating for electrical output capacity) be adopted for electricity generators until such time as the scheme is expanded to cover the remainder of the stationary energy sector.

In considering a threshold for electricity generation coverage, capacity was considered to be a simple and readily identifiable measure, and a reasonable proxy for emissions. Levels from 5 MWe to 200 MWe of electrical output capacity were examined according to criteria of efficiency, administrative cost and effectiveness. Although all thresholds had advantages and disadvantages, some additional matters supporting a threshold of 30 MWe were that:

- generators over 30 MWe are already subject to environmental licensing in all jurisdictions
- a threshold between 10 MWe and 35 MWe is consistent with stakeholders' suggestions and broadly in line with thresholds adopted in the EU ETS and the US North East States' Regional Greenhouse Gas Initiative (RGGI) schemes
- 30 MWe is the threshold size of a scheduled generating unit operating under the coordinated central dispatch system in the eastern States' National Electricity Market.

A threshold of 30 MWe would cover around 100 electricity-generation facilities and between 97% and 99.5% of emissions from electricity generation,<sup>23</sup> or about 35% of total greenhouse gas emissions in Australia.

It is recognised that limited coverage poses some risks of inefficient substitution effects. For example, in Queensland, coal is transported using electric-powered locomotives, which face competition from diesel-powered locomotives. Emissions associated with electricity

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<sup>22</sup> Threshold types considered were: capacity (MWe (megawatts of electrical output) and MWth (megawatts of thermal output)); energy input, output and costs; GHG emissions; value and volume of output.

<sup>23</sup> Derived from George Wilkenfeld & Associates Ltd, 2006: *Cost and benefits of national greenhouse and energy reporting requirement: regulatory impact statement*. Report prepared for the Department of Environment and Heritage. It is assumed that 30 MWe and larger power stations generally emit more than 25 kt CO<sub>2</sub>-e a year, assuming base load use in off-grid locations and gas-fuelled intermediate or peak load use in on-grid locations.

generation would be covered under this option, but emissions from diesel powered locomotives would not. This would potentially shift marginal transport costs in favour of diesel. Comment is sought on how such boundary issues could be addressed until such time as any NETS were ever extended to cover transport emissions.

### **Phased inclusion of other stationary energy emissions**

Although it is proposed that the scheme begin with electricity only, it remains desirable that the scope of the scheme be broadened over time.

It is proposed that emissions arising from stationary combustion of other fossil fuels (in particular gas, coal and oil) be included in the scheme's coverage 5 years after scheme commencement. The reasons for commencing with electricity only are set out above. Inclusion of the remainder of stationary energy after a 5-year period would:

- increase the number of participants in the permit market, improving liquidity and market efficiency
- address any short-term distortions between energy sources and, in doing so, avoid the risk of over-switching to direct use of gas-, oil- or coal-based fuels
- provide appropriate signals for the timing of investments in low-emissions technologies over time.

Having considered a broad range of possible thresholds and points of liability, it is proposed that a threshold of 25 kt CO<sub>2</sub>-e greenhouse gas emissions a year be adopted for coverage of the broader stationary combustion sector. As emissions levels vary from year to year, it is proposed that a facility that exceeds the threshold should remain in the scheme for a fixed minimum period of time, with its further inclusion re-assessed at the end of that time based on monitoring data.

It is also proposed that the 25 kt CO<sub>2</sub>-e threshold apply to:

- electricity generators from the time that other stationary combustion sources are included in the scheme, thereby replacing the initial 30 MWe threshold
- gas retailers in respect of the imputed emissions arising from their sales of gas<sup>24</sup> to their customers (other than large customers who are directly liable for their emissions), thereby making gas retailers a point of liability and covering emissions from small users of gas.<sup>25</sup>

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<sup>24</sup> Excluding gas fuels used in the transport sector, such as liquefied petroleum gas (LPG).

<sup>25</sup> This theoretically creates a perverse incentive for small emitters to switch over to oil or coal, or to undertake waste-to-energy conversion. However, in many cases coal and oil would not be fit-for-purpose. This suggests that such switching would occur at the margin, and the extent to which this occurred would be an empirical question. As such, the use of these fuels would be monitored periodically and either thresholds or points of liability modified if required.



Levels ranging from 5 kt to 100 kt of CO<sub>2</sub>-e a year were considered, both as harmonised thresholds across all fuels and as separate thresholds differentiated by fuel type. The use of a harmonised threshold across all fuels is preferred, to avoid administrative difficulties arising from needing to account for different fuel types and to avoid having to designate a 'primary' fuel or attempt to set threshold aggregation rules for a multi-fuel facility.

A threshold of 25 kt CO<sub>2</sub>-e emissions is equivalent to around 480 TJ (terajoules) of gas use a year, around 10 kt of black coal, and just over 9000 kL of oil (industrial diesel).<sup>26</sup> Around 150 facilities (including gas retailers but excluding electricity generators) would exceed this threshold, giving coverage of around 83%<sup>27</sup> of emissions from non-electricity generation use of coal, gas and oil or 10% of total Australian greenhouse gas emissions.

The proposed NETS design excludes coverage of petroleum refining emissions. The increase in oil prices over the last two years is equivalent to an emissions price of around \$180/t CO<sub>2</sub>-e, which is significantly greater than any change in relative prices that might occur under an emissions trading scheme.

#### *Alternative coverage option*

The alternative coverage option is to include all stationary energy emissions (as described above) from the time of the scheme's commencement. Under this option, the threshold for coverage would commence at 25 kt CO<sub>2</sub>-e, with no initial threshold of 30 MWe for electricity generators. The advantages and disadvantages of this alternative option could be considered to be the opposite of the advantages and disadvantages of the preferred option, described above.

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<sup>26</sup> AGO 2005, *Factors and Methods Workbook*. Department of Environment and Heritage, Canberra.

<sup>27</sup> George Wilkenfeld & Associates Ltd 2006, *Cost and Benefits of National Greenhouse and Energy Reporting Requirement: Regulatory Impact Statement*. Report prepared for the Department of Environment and Heritage, Canberra.

*It is proposed that the scheme's coverage commences with:*

- *initial coverage of electricity generators only, where those generators have a capacity of 30 MWe nameplate rated electrical output capacity or more; then*
- *expansion of coverage five years after scheme commencement to include other stationary energy sources which emit more than 25 kt CO<sub>2</sub>-e a year from stationary combustion of gas, oil, coal and other fossil fuels.<sup>28</sup>*

*(An alternative coverage option is to include, from the time of scheme commencement, all facilities (including electricity generators) emitting more than 25 kt CO<sub>2</sub>-e a year from stationary combustion of gas, oil, coal and other fossil fuels.)*

*It is further proposed that:*

- *at the time that scheme coverage is expanded to include emissions from stationary combustion of gas, coal, oil and other fossil fuels:*
  - *gas retailers be included in the scheme's coverage with liability for the imputed emissions arising from their gas sales to customers (excluding gas delivered to facilities emitting more than 25 kt CO<sub>2</sub>-e a year)*
  - *large emitters (> 25 kt CO<sub>2</sub>-e) who receive 100% of their gas supply from retailers have the opportunity to opt out of direct coverage and become indirectly covered by retailers*
  - *the threshold of 25 kt of CO<sub>2</sub>-e emissions from fossil fuel combustion be applied as the threshold for electricity generation coverage also*
- *petroleum refineries be excluded from liability initially.*

*Comment is sought on these proposals and on other possible coverage options.*

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<sup>28</sup> Such as energy recovery from plastics, vulcanised rubber or other hydrocarbon-bearing substances.

### 2.2.5 Aggregation

Depending on what level of aggregation the threshold is based on, it could lead to an incentive for operators to split companies into sub-companies to circumvent the coverage rules. This could also occur by building a number of small facilities—with even lower efficiency and therefore higher emissions—below the threshold instead of one bigger facility, or dividing the sites into sub-sites. To prevent such perverse incentives an **aggregation rule** has been implemented under the EU emissions trading scheme, which states:

Where one operator carries out several activities falling under the same subheading in the same facility or on the same site, the capacities of such activities are added together.

It is proposed that a similar aggregation rule be adopted in the NETS.

*Comment is sought on the proposal that an aggregation rule be included in the scheme to avoid incentives to circumvent coverage.*

## 2.3 Coverage of fugitive emissions

It is not proposed to include liability for fugitive emissions in the coverage of the scheme at its commencement. However, at the time that coverage is expanded to include non-electricity combustion emissions from gas, coal, oil and other fossil fuels, it is proposed to include coverage of fugitive emissions from distribution and transmission pipelines. As discussed below, there are a number of impediments to inclusion of other types of fugitive emissions at this stage.

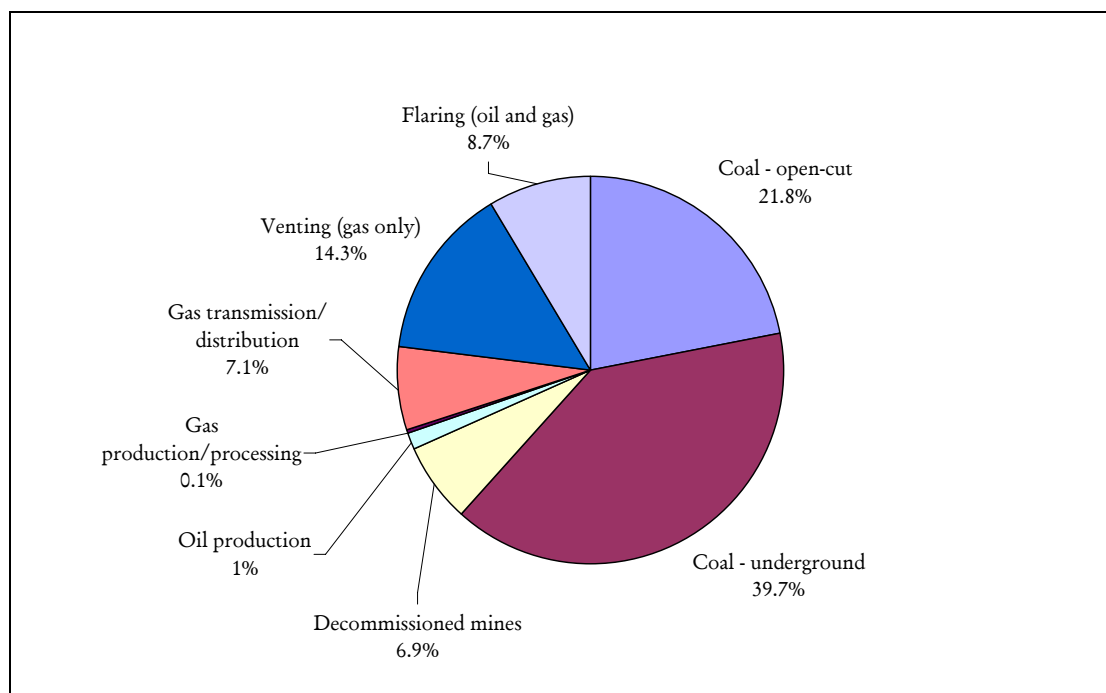
### 2.3.1 Emissions from the fugitives reporting sector

Fugitive emissions are emissions (other than those attributable to energy use) from:

- coal mining and handling (solid fuels)
- oil and natural gas production, processing and transportation.

Fugitive emissions totalled 31 million tonnes CO<sub>2</sub>-e in 2004, 68.5% of which arose from black coal mining and 31.5% from oil and gas production, processing and transportation. A more detailed breakdown is shown in Figure 2-2.

**Figure 2-2: Fugitive emissions, 2004**



Source: AGO, *National Greenhouse Gas Inventory*, 2004

### 2.3.2 Issues associated with coverage of fugitive emissions

Fugitive emissions occur from a number of different types of activity within coal, oil and gas production, processing and transportation. As fugitive emissions are attributable to fuels used in stationary energy and therefore form part of their full fuel cycle emissions, fugitive emissions should also be covered by the scheme.<sup>29</sup> However, several issues arise that make coverage of fugitive emissions problematic.

Only some fugitive emissions can be accurately monitored and abated. For example, in respect of open cut mining, which contributes around 20% of all fugitive emissions, the AGO<sup>30</sup> concluded that:

... there is no proven or cost effective means for achieving significant mitigation of methane emissions from open cut [coal] mining, and no prospect of such means within the foreseeable future.

<sup>29</sup> The EU ETS has focused on CO<sub>2</sub> emissions so far and has not included fugitive emissions. However, the directive allows for other greenhouse gases to be added. A recent study contributing to the review of the Scheme has proposed to include methane from active underground coalmines after 2012. (AEA Technology Environment and Ecofys UK, April 2006: *LETS Update: Decision Makers Summary 2006*. Report prepared for LIFE Emissions Trading Scheme Update Partners.)

<sup>30</sup> AGO 2005, *Fugitive Sector Greenhouse Gas Emissions Projections 2005*. Department of Environment and Heritage, Canberra, p. 37

There is also limited scope for reducing the fugitive emissions that occur as a result of carbon dioxide venting from gas processing plants or created by flaring, which also account for around 20% of total fugitive emissions. Flaring is itself a significant abatement activity, converting methane to carbon dioxide and thereby reducing the Global Warming Potential of emissions by 95%. However, once the methane is converted to carbon dioxide, the direct abatement possibilities remaining are limited to techniques such as reinjection or CCS.

Some offshore gas and oil fugitive emissions occur in Commonwealth waters. This most likely leaves those emissions outside scheme jurisdiction should the Commonwealth Government choose not to participate in the scheme. Excluding offshore fugitive emissions while including onshore fugitive emissions would create significant distortions between the treatment of onshore and offshore oil and gas production.

Similarly, distortions between coal and gas could arise if fugitive emissions from one fuel were covered by the scheme but fugitive emissions from the other source were not.

### **2.3.3 Proposals for fugitive emissions**

From the discussion above, it appears unlikely that comprehensive coverage of fugitive emissions could be achieved under the emissions trading scheme without creating significant distortions between fuels or between different sources of the same fuel. Various ways of avoiding such distortions have been considered, for example through the use of generic emission factors where measurement is not possible, and by making downstream parties liable for the fugitive emissions of upstream producers. However, it is not clear that such approaches would be the most efficient or effective way of managing emissions from those sources.

Fugitive emissions from gas transmission and distribution are an exception. These emissions occur fully within State and Territory jurisdiction and are measurable. They are also relatively small, so their inclusion in scheme coverage would not introduce a significant distortion between gas and coal. It is proposed that fugitive emissions from gas transportation and distribution be introduced via placing a liability on gas transmission and distribution companies, at the same time that gas retailer liability commences. The remaining sources of fugitive emissions would be managed by complementary measures such as regulation.

*It is proposed that:*

- *coverage of fugitive emissions from gas transportation and distribution be introduced at the same time as coverage of direct gas combustion, with liability to be placed on gas transmission and distribution companies, respectively*
- *fugitive emissions from sources other than gas transportation and distribution be excluded from liability under the initial coverage of the scheme.*

*Comment is sought on these proposals.*

## 2.4 Coverage by type of greenhouse gas

State and Territory Governments have endorsed the design proposition that the NETS cover all six greenhouse gases under the Kyoto Protocol.

The Kyoto Protocol covers the six key gases that contribute to climate change: carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), sulphur hexafluoride (SF<sub>6</sub>), perfluorocarbons (PFCs) and hydrofluorocarbons (HFCs). The gases have varying potencies, and can be compared against each other in CO<sub>2</sub>-equivalent terms. The comparisons are normally made using 100-year Global Warming Potentials.

### 2.4.1 Stakeholder views

Stakeholders were divided on this design proposition.

Those **supporting** inclusion of all six gases suggested that this would allow for wider coverage at the start of the scheme and a broad range of offsets, thereby lowering the cost of the scheme. Support was subject to the provision that emissions accounting standards were adequate and that emission factors could be used to keep monitoring costs down.

Those **opposing** inclusion of all six gases preferred commencing with CO<sub>2</sub> only, or CO<sub>2</sub> and methane, to build confidence in the system and avoid large amounts of effort to measure small amounts of some gases. It was suggested that CO<sub>2</sub> coverage could be mandatory within covered sectors with coverage of other gases allowed through project-based opt-in provisions (that is, offsets).

Some stakeholders expressed a preference for all emissions to be reported as CO<sub>2</sub>-e based on their Global Warming Potentials. A small number of stakeholders also identified as a possible source of investment uncertainty the potential for Global Warming Potentials to be varied from time to time on the basis of new scientific findings, and suggested that these needed to be locked in for some fixed duration.

### **2.4.2 Emissions by gas**

Emissions from stationary energy are mostly carbon dioxide (99.2%), with a small contribution from methane (0.5%) and nitrous oxide (0.3%) generated during combustion.<sup>31</sup>

Emissions from fugitive sources are mostly methane (82%), with the remainder from carbon dioxide (18.9%) and nitrous oxide (0.1%).

Across all sources, carbon dioxide accounts for the largest share of national emissions (71%). Methane is the second most significant greenhouse gas (23%) on a CO<sub>2</sub>-equivalent basis, followed by nitrous oxide (5%). The remaining greenhouse gases (perfluorocarbons, hydrofluorocarbons and sulphur hexafluoride) together account for only 1% of national emissions, but have very high Global Warming Potentials, possibly providing highly cost-effective abatement opportunities.

### **2.4.3 Assessment**

The additional administrative costs of covering all six gases compared with a subset of gases would be small, as most emissions are currently estimated via application of emission factors to activity or output levels. Inclusion of all six gases would ensure maximum coverage for the scheme, and administrative simplicity if it were expanded to cover other sectors at a later stage.

In addition, some abatement options for other gases may be cheaper than measures to abate carbon dioxide, and should logically be implemented first. The major limitation in restricting a scheme to carbon dioxide only would be the loss of a potentially broad suite of offsets.

It is proposed that all six gases be included in the scheme, but with liable parties only being required to monitor and report emissions of the three gases they emit, while leaving offset providers eligible to create offset credits via reductions of any of the six gases.

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<sup>31</sup> Source: Australian Greenhouse Office, *National Greenhouse Gas Inventory*, 2004

*It is proposed that:*

- *the NETS cover all six gases under the Kyoto Protocol*
- *liable parties under the NETS be required to monitor and acquit permits for emissions of carbon dioxide, methane and nitrous oxide only*
- *offsets providers be allowed to create offsets via reductions or sequestration of all six gases (See Chapter 5)*
- *the scheme's legislation stipulate a process that must be adhered to before the scope of gas coverage is widened or existing Global Warming Potentials are altered—this should include appropriate quarantine or transitional assistance arrangements for investments made on the basis of earlier Global Warming Potentials.*

## **2.5 Future changes to scheme coverage**

Changes in the sectoral coverage (and to a lesser extent, the gas coverage) of the scheme can create uncertainties for all those affected by the scheme. In particular, changes to the scope of the scheme can affect:

- those creating offsets for activities that were previously outside the cap, but are now being brought into the cap (which would mean that the project could no longer be counted as an offset)
- those who are making investments whose costs would be affected by bringing new activities into the cap
- all current liable parties (and their downstream customers) if broadening of the coverage were to result in a change to permit prices.

Therefore, the scope of the scheme must be altered with care. The scheme must be sufficiently flexible to allow its scope to expand over time, yet reasonable notice and certainty must be provided to affected participants.



### 2.5.1 Proposed process for making changes to scheme coverage

The following process is proposed to achieve a balance between certainty for those affected by the scheme and flexibility over time. It is proposed that:

1. a legislated timetable be provided prior to scheme commencement, which sets out dates when coverage would be expanded beyond electricity generation to include other stationary energy emissions (based on the preferred option, see Section 2.2.4)
2. a specified process be provided that must be adhered to before expanding scheme coverage to sectors other than stationary energy, changing greenhouse gas coverage, or altering the thresholds for coverage within the stationary energy sectors.

#### *Legislated timetable for coverage of stationary energy emissions*

Significant analysis of the stationary energy sector and of fugitive emissions sources has been carried out, as described above. Sufficient information is available to provide a legislated timetable for the future inclusion of stationary gas, coal and oil combustion.

The date on which liability would be extended to cover these emissions could be specified in the legislation. In addition, the change in specification of the cap that is necessary to accommodate an expanded scheme coverage (that is, the number of extra permits made available) would also need to be identified (see Chapter 3).

#### *Specified process for coverage of other sectors or gases*

For expansions of coverage other than those described above,<sup>32</sup> it is proposed to include a strict process that must be adhered to before the scope of the scheme may be broadened.

Elements of this process should include:

- Most importantly, a **minimum period of notice** that must be given before a new activity is to be added. For example, if industrial process emissions were ever to be covered, then a minimum period of notice of this change could be in the order of 5 years (an exception to this might occur if an international agreement were reached).
- A **consultative process** to be undertaken before the scope is broadened. This process could be similar to the process for the initial scheme development: a background paper explaining why governments are considering the change, a Discussion Paper, and associated submission periods and discussions with stakeholders.

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<sup>32</sup> Amendments to coverage other than that proposed under the legislated timetable could include:

- sectors other than stationary energy
- sub-threshold facilities within the stationary energy sector
- new greenhouse gases, or
- new Global Warming Potentials for the existing suite of greenhouse gases, for example if new international protocols were adopted under the UNFCCC.

- **Minimisation of the potential for large, sudden impacts on permit prices** when governments are deciding on the number of new permits to be added when the scope is broadened. Inclusion of a new sector would require an adjustment to future annual cap levels (and permit numbers). This needs to be done in a way that minimises changes to the price of permits at that time, for example, by assessing the opportunities for abatement in the new sector, the extent of emissions in the new sector, and the cost of those opportunities.

*It is proposed that fixed dates for inclusion of emissions, and cap levels, be specified in scheme legislation for emissions from stationary combustion of gas, coal, oil and other fossil fuels (excluding emissions from petroleum refineries).*

*For sectors other than stationary energy, it is proposed that a specified process be adopted that must be adhered to before the scope is widened. This should include a minimum period of notice (for example, 5 years) that must be given before new activities or sectors are added.*

## 2.6 Emission sources excluded from scheme coverage

It is proposed above that most sources of stationary energy (that is, fuel combustion) emissions be included within the scheme's coverage, with liability for emissions. Sources proposed for exclusion from liability under initial scheme coverage are:

- petroleum refining
- electricity generators below 30 MWe capacity from 2010–14
- stationary combustion sources emitting less than 25 kt CO<sub>2</sub>-e from 2015 onward
- mobile sources within the stationary energy reporting category<sup>33</sup> (for example, lawn-mowers, fishing vessels).

Within the fugitive emissions reporting category, sources proposed for exclusion from liability under initial scheme coverage are:

- venting and flaring at oil and gas production and processing facilities
- emissions of methane from black coalmines.

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<sup>33</sup> 'Reporting category' refers to stationary energy under the *National Greenhouse Gas Inventory 2004*, AGO, Department of Environment and Heritage, Canberra.

No other sectors outside stationary energy and fugitive emissions are proposed for coverage initially. Types of emissions for which no liability would arise under the scheme therefore include:

- industrial process emissions, such as perfluorocarbons from aluminium smelting, blast furnace gases from iron production, carbon dioxide from calcination of lime in cement making, and nitrous oxide emissions from ammonia production
- emissions from transport fuel combustion
- methane and nitrous oxide emissions from ruminant animals and soils in the agriculture sector
- carbon dioxide emissions from soil management practices, land clearing and deforestation
- methane and nitrous oxide emissions from waste facilities.

Reductions in emissions from these sectors, and carbon sequestration where it occurs, may be eligible to create offset credits, as discussed in Chapter 5.

## 2.7 Scheme coverage over time

Figure 2-3 and Figure 2-4 below give an overview of the proposed coverage of the scheme over time. The types of facilities that could be covered by a 25-kt CO<sub>2</sub>-e threshold include:

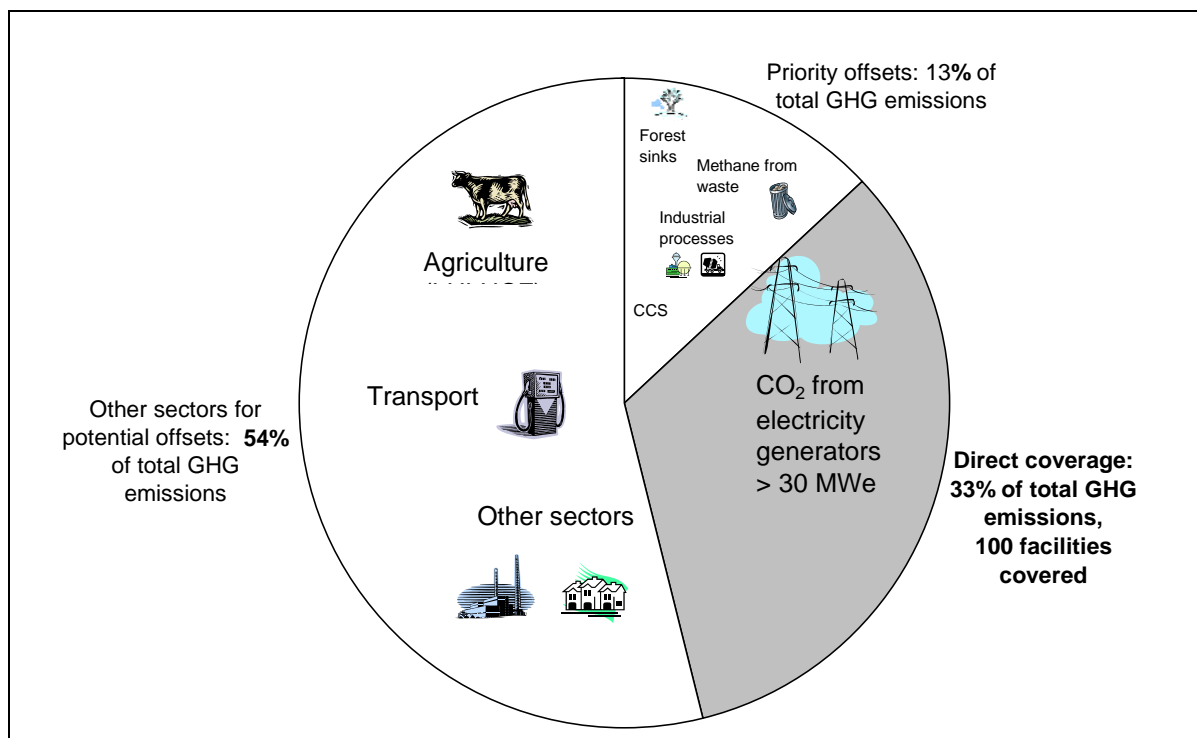
- most public electricity-generating facilities
- private on-site electricity generation (for example, for pumps, compressors, and crushing and grinding plant) as well as boilers and heaters<sup>34</sup>
- iron and steel industry facilities for direct heating, drying, or any other treatment of objects or materials (for example, reheating furnaces, furnaces for heat treatment)<sup>35</sup>
- chemical industry facilities for regeneration of catalytic cracking catalysts
- cement and lime industry: rotary kilns for the production of clinker
- glass, brick and ceramic manufacturing facilities
- paper industry facilities for the production of pulp from timber or other fibrous materials, as well as paper and board.

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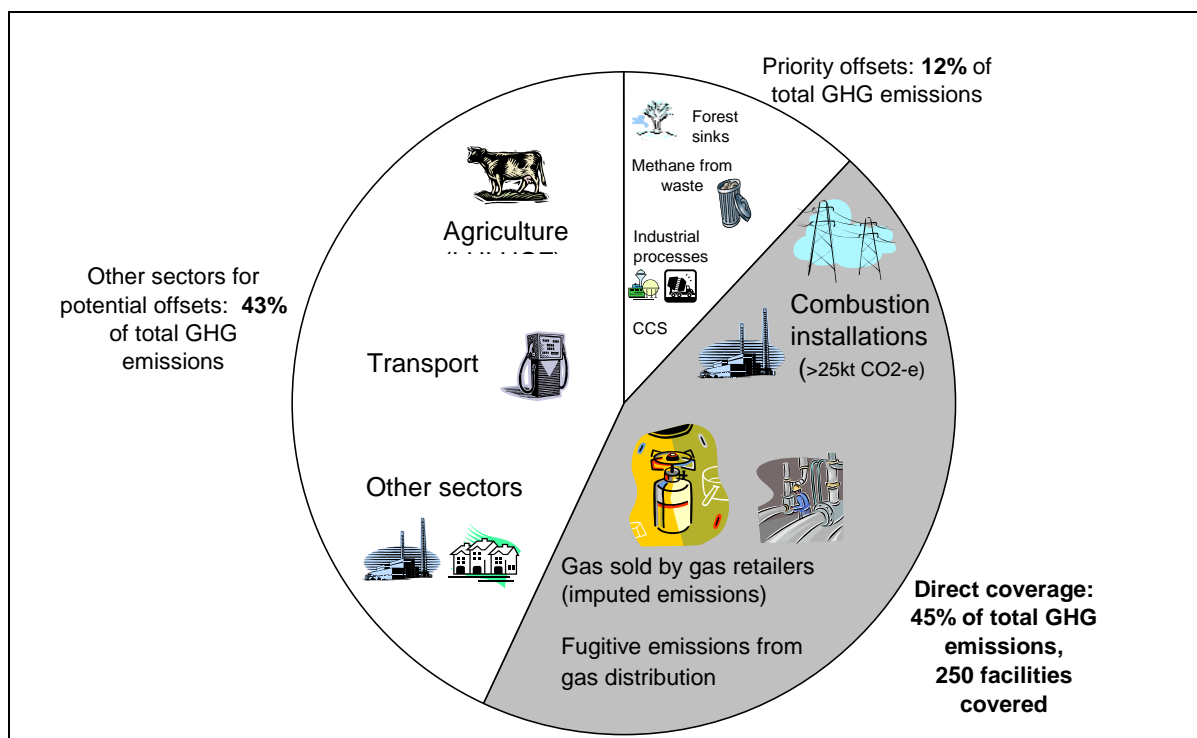
<sup>34</sup> The definition of stationary energy includes diesel generators, even though they might be mobile.

<sup>35</sup> Excluding emissions resulting from the capture and combustion of coke oven gas, blast furnace gas and steelmaking gas. These gases, which arise from iron and steelmaking, would be counted as zero emission fuels in order to exclude industrial process emissions.

**Figure 2-3: Proposed sources and gases covered in initial phases of a NETS**



**Figure 2-4: Proposed sources and gases to be covered 5 years following NETS commencement**



Sources for Figures 2-3 and 2-4 : Estimates based on Australian Greenhouse Office 2005, *Australia's Fourth National Communication on Climate Change*, DEH, Canberra.

## 2.8 Conclusion

It is proposed that the NETS cover:

- At the time of scheme commencement:
  - electricity-generating facilities with greater than 30 MWe nameplate rating of electrical output capacity
- At the end of year 5 of the scheme:
  - all facilities emitting more than 25 kt of CO<sub>2</sub>-e a year from stationary combustion of gas, coal, oil and other fossil fuels
  - gas retailers whose imputed emissions from gas sales are more than 25 kt of CO<sub>2</sub>-e a year
  - gas transmission and distribution companies, for their fugitive emissions from gas transmission and distribution.

It is also proposed that the NETS cover:

- only combustion-related or fugitive emissions of carbon dioxide, methane and nitrous oxide from the liable parties described above (that is, excluding liable parties' emissions from industrial processes, transport and non-energy sources)
- abatement or sequestration of all six greenhouse gases under the Kyoto Protocol by offsets providers.

It is proposed that changes to sectoral emissions coverage or gas coverage should be made by means of:

- a timetable included in the initial scheme legislation; there could be agreement in advance on the sectoral emissions to be included in the scheme and on a timetable for their inclusion
- a specified process for including other sectoral emissions, altering thresholds in covered sectors, and making changes to gas coverage—the process would include a minimum period of notice (say, 5 years), consultation provisions, an assessment of opportunities for abatement, and an aim of minimising large, sudden impacts on the emissions permit market.

Coverage arising from these proposals is estimated to range from:

- if the scheme were to commence for example in 2010, approximately 190 Mt from around 100 facilities at the scheme's commencement, covering about 33% of total projected GHG emissions in Australia at that time (based on AGO projections of emissions growth 'with measures')

increasing to:

- approximately 275 Mt from 250 facilities in 2015 (if the scheme were to commence for example in 2010) , covering around 45% of total projected GHG emissions in Australia at that time (based on AGO projections of emissions growth 'with measures').
-

## **3 Scheme cap**

*This Chapter examines options for setting the duration, trajectory and level of the NETS cap. Key considerations in setting the cap include international climate change negotiations, climate change science, and economic and technological developments. The Chapter also examines how the inclusion of additional sectors following the scheme start date could require the cap to be adjusted to reflect the additional emissions from those sectors. Furthermore, the role of banking and borrowing in providing scheme participants with flexibility in complying with the cap is discussed.*

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### **3.1 Setting the scheme cap**

#### **3.1.1 Key considerations**

The scheme cap sets a limit on the number of tonnes of greenhouse gas emissions that could be emitted by the covered sectors without incurring a penalty. Determining the duration, trajectory and level of the cap for the NETS is a fundamental design issue. It defines the magnitude of the abatement task and significantly affects most other scheme design choices.

There are a number of key considerations in setting the scheme cap.

First, the scheme cap should preferably be consistent with a long term reduction target. Stakeholder views are sought on setting Australia on a path towards reducing greenhouse gas emissions by around 60% compared with 2000 levels by the middle of the century.

Second, in determining the trajectory of emission reductions, the cap should allow for the Australian economy to transition as smoothly as possible to a carbon-constrained future. Australia has an energy-intensive economy that obtains its competitive advantage from low-cost and abundant fossil fuels. A cap appropriately geared to the rate at which the economy can adjust would ensure that any costs to the economy in the short to medium term were manageable, and would help position industry and the community generally for potentially much larger reductions in emissions in the future.

Third, the cap should be able to respond flexibly to the evolving scientific understanding of climate change.

Fourth, the cap-setting should consider the realities of the energy market. The electricity generation industry is characterised by lumpy, long-lived investments. Once built, new generation plant is likely to last for many years—at least 40 years. The cap-setting process should also consider the need for new investment in generation plant, refurbishment and retirement of existing plant, and the cost and availability of low-emission technologies. It would need to incorporate an assessment of the extent to which low cost energy efficiency options are available.

The cap also needs to move in step with the evolution of low-emission technologies and their potential commercialisation and deployment. The costs of renewable technologies, as well as lower-emission coal-fired technologies, are currently high but likely to fall over time. However, considerable uncertainty surrounds the future commercialisation and cost of these technologies.

Finally, given that the framework for international climate change action beyond 2012 remains uncertain, the cap should be able to adjust flexibly to reflect future international obligations. The scheme should provide a framework within which the market can make judgements about the direction of these future cap movements while preserving a reasonable degree of investor certainty.

Kyoto Protocol-ratifying countries agreed in December 2005 to start negotiations to extend commitments under the Kyoto Protocol beyond 2012. An agreement was also made to launch talks under the United Nations Framework Convention on Climate Change (UNFCCC), to which non-Kyoto ratifying countries, including Australia and the United States, are also parties. Australia is to co-chair the Dialogue on Long-term Cooperative Action on Climate Change, which will discuss international action post-2012. These discussions are at a preliminary stage and it may be wise to consider domestic action on the assumption that there will be early and clear conclusion to the negotiations.

### **3.1.2 Objectives**

Chapter 1 outlined general objectives in designing a NETS, including environmental integrity, investor certainty, management of impacts on the economy, equity and flexibility. Building on those broad objectives, the design of the scheme cap will aim to:

- provide existing and potential investors with sufficient confidence to allow them to plan and proceed with investment
- provide a framework to achieve emissions reductions over time that are consistent with international developments and scientific findings
- provide an incentive for energy investors and purchasers to identify and develop energy supply and energy demand management approaches that will move Australia along a pathway toward a low-emissions future
- maintain and enhance Australia's energy security, dynamic economic efficiency, competitiveness and long-term economic growth prospects
- maintain flexibility in the face of uncertainty over future international commitments, the availability and cost of abatement technology, and the need to respond to additional information brought forward from advancing climate change science
- identify and pursue a transition path to deep cuts in greenhouse emissions that protects Australia's economic interests by minimising costs and avoiding large, sudden negative impacts.



### **3.1.3 Duration and trajectory of the cap**

The number of years in advance for which caps are set (the cap period) has important implications for investor certainty, as well as for the flexibility of governments to respond to future developments.

A short cap period with an allied short time frame for which permits are issued—say, 5 years—is unlikely to provide investors with sufficient certainty to make investments. Investments in the stationary energy sector are typically long-lived and require long lead times. A short cap period is therefore likely to see investors defer decisions to replace ageing plant and to meet growing power demand. One of the key criticisms of the EU ETS is that the first two phases of the scheme (2005–07 and 2008–12) provide insufficient certainty and predictability for companies making investment decisions on long-lived assets (see Chapter 10).

A longer-term cap period—say, 30 years—would provide greater investor certainty. However, this would be at the expense of flexibility. Governments would face the risk that the cap might need to be altered in the future should, for example, an international agreement on climate change action emerge that requires more (or less) aggressive abatement than was envisaged under the original cap. Long-term caps and permit allocations would transfer risks in the following ways:

- If the original cap were too loose, risks would be transferred to taxpayers. This is because governments would be required to buy back permits that they had previously distributed.
- If the original cap were too restrictive, risks would be transferred to those who had invested in more expensive abatement options than they might otherwise have selected; to holders of permits (the value of which would be reduced if additional permits were issued); and to offset creators, whose activities would become less valuable if the cap were loosened.

The trajectory of the annual caps during the cap period is also an important consideration. How quickly emissions should be reduced—and at what cost—is a decision that needs to take into account the age of existing generation plant, the likely timing of new capacity, the costs of different abatement options, the availability and cost of offsets, and how all of these costs might change over time. For example, for a given overall emissions cap, a more aggressive abatement path would require significant reductions early in the cap period and (depending on the stringency of the overall cap) could require the early retirement of existing plant. By comparison, the same overall cap could be achieved at a lower cost if the abatement trajectory were set to move in step with the need for new plant, the retirement of existing plant, and the commercialisation and deployment of low-emission technologies in the market place.

The implications of different cap trajectories from an environmental point of view also needs to be considered given that greenhouse gases accumulate and are long-lived in the

atmosphere. Delaying action to reduce emissions can exacerbate climate change. Setting an appropriate cap trajectory is a challenging exercise given the uncertainties involved.

A number of stakeholders argued that it is critical that the scheme design set interim caps to allow for better decision-making with respect to long-lived assets. For example, Origin Energy argued that:

... given that a number of pathways could be used to achieve the aspirational target, the initial cap should relate to an indicative pathway; the initial cap should be fixed for a 15 year period, with a review of the forward 15 year period at least 3 years before the commencement year. (submission 52, p.10)

The Business Council for Sustainable Energy noted that a scheme could be developed that has an initial 5-year period (2008–12):

... with a legislated option that this will extend out on a rolling four year basis if no international agreement on controlling greenhouse emissions (to which Australia is a ratifying party) exists or is an imminent prospect by the close of 2011. The targets for each four year stage up to the end of 2024 should be announced at the outset of the scheme. (submission 24, p.5)

The Energy Users Association of Australia recommended that:

Governments should consider using best estimates on what the future abatement targets might be and set a range in order to facilitate the development of permits. By setting a range of future abatement levels, the risk of error will be minimised, while also allowing for economic signals to prevail. (submission 58, p.6)

The Total Environment Centre (submission 18, p.6) was of the view that governments should specify that permitted emissions may be curtailed in future without indemnity for carbon risk, and that governments should have the ability to change caps, similar to the flexibility they have to change tax rates.

### **3.1.4 Gateways**

One approach that could help balance the level of investor certainty and flexibility provided by the scheme is to adopt a mix of firm caps and a ‘gateway’, or range, for potential future caps. Figure 3-1 illustrates the concept.

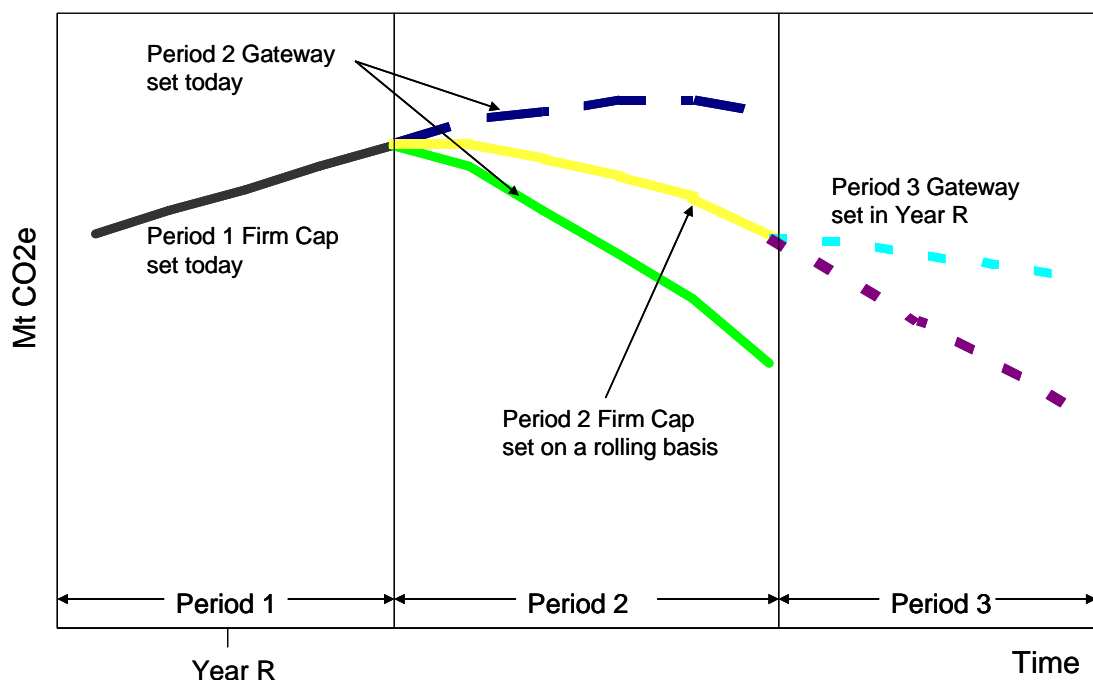
A company making an investment decision today would have a clear view of the cap during the early years of the scheme (period 1), when firm caps had been set. It would also have a view of the upper and lower range of potential caps during the latter part of the scheme (period 2).

Additional years of firm caps and gateways would be added at Year R—an appropriate time during period 1 when there would be more information, for example, about international obligations and technology costs during period 2. The additional firm caps would be selected from within the upper and lower gateways for period 2. The gateway for period 3 would also be set in Year R. This approach would be repeated into the future so that investors would continually have information on a set period of firm caps and a range of potential future caps.

This mix of firm caps and gateways aims to meet the needs of investors and governments together. Whereas gateways do not provide exact future caps, they do provide information about the range of the future abatement task. When combined with the firm cap, this information could reduce risk and give investors sufficient confidence to invest in low-emission technologies.

At the same time, gateways would provide governments with the flexibility to set future caps as new information, such as developments in climate change science, becomes available. This reduces the risk of governments overestimating or underestimating the need for future abatement and thereby mitigates potential large, sudden impacts on the economy.

**Figure 3-1: Illustration of the gateway mechanism**



### 3.1.5 Proposed cap period

It is proposed that firm annual caps be set for the first 10 years of the scheme and a gateway for possible future caps be set for the second 10 years of the scheme. Following the proposed commencement of the scheme, a firm cap for an additional year within the bounds of the gateway would be announced on a rolling annual basis. There would thus always be 10 years of firm caps. The gateways for possible future caps would be updated and extended every five years.

Permits with ‘date stamps’<sup>36</sup> related to each year through to 2030, were the NETS to commence in 2010, could be issued in advance up to the lower bound of the gateway. This would add to the credibility of the gateway and provide a strong foundation for long-term investment over the period and facilitate a liquid permits market with its associated carbon price profile.

Broadly, the proposed approach would be as follows:

- **Step 1:** Before the commencement of the scheme, governments would announce firm annual caps for the first ten years (eg, 2010–19), plus the ranges of emissions within which caps would be set for the next ten years (eg, 2020–29).
- **Step 2:** After the commencement of the scheme, governments would announce an additional year of firm caps, chosen from within the range of possible caps announced during Step 1, on a rolling annual basis. Were the scheme to commence in 2010, for example, governments could announce the firm cap for 2020. (If the firm cap was higher than the lower bound of the gateway in 2020, more permits would be issued for that year. Alternatively if there is a need to tighten the cap below the lower bound then governments would have to acquire permits from the market providing an automatic compensation for those who had relied on the cap estimates.) This step would be repeated on a rolling basis so that investors would always have 10 years of firm caps.
- **Step 3:** At the time of the proposed scheme review, 5 years following the NETS commencement (see Chapter 8), governments would announce a further range of possible caps for years 2030–34 of the scheme and could issue permits in advance up to the lower bound of the gateway. As a result, there would be 10 years of cap ‘gateways’ once more. Step 3 could be repeated at 5 yearly intervals following the commencement of the scheme.

A 10-year period of firm caps is proposed because uncertainties would be increasingly problematic post-2020—particularly the nature of international obligations and the availability and cost of low-emission technology. It is anticipated that there would be much better information about these issues over time. There would also be much better information about the scale of major new resource developments, energy-use patterns more generally, and the resilience of the economy to changes in energy prices.

The proposed approach aims to provide the certainty required by investors to plan and proceed with large, long-term investments in low-emission technologies. Investors would always have 10 years of firm caps, and permits could be issued up to the lower bound of the gateway for the subsequent 10 years. The setting of the upper bound of the gateway would also provide investors with information about what the limits on their future emissions might be for the subsequent 10 years.

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<sup>36</sup> A ‘date stamp’ refers to the vintage of a permit, that is, the first year on which it becomes valid.

As discussed above, choosing a longer period of firm caps—say, 15 or 20 years—would provide additional certainty to investors, but this would be at the expense of policy flexibility—and, therefore, risk to government and those affected by policy decisions—during a period of substantial uncertainty. Conversely, a shorter period of firm caps combined with a longer period of gateways would be likely to provide considerably less investor certainty, recognising the longevity of electricity sector assets.

The issue of the trajectory and level of the firm caps and gateways is considered in the next section in the context of setting an overall scheme cap.

*It is proposed that firm annual caps be set for the first 10 years of the scheme (eg., 2010–19) and a range of possible future caps ('gateways') for the following decade (eg., 2020–29). Following the proposed commencement of the scheme governments would announce a firm cap for an additional year (within the bounds of the gateway) on a rolling annual basis, so that there would always be 10 years of firm caps. Every five years, gateways would be updated and extended by a further five years.*

### 3.1.6 The overall scheme cap

Stakeholders' views on setting the level of the scheme cap were varied.

The Southern Metropolitan Regional Council noted:

Scheme caps should be set within the first Kyoto period to afford Australia the opportunity to engage Kyoto compliant countries with discussions regarding the second period and align its targets accordingly. However, there is a strong likelihood that emissions reduction targets will need to be set higher for the second Kyoto period to offset adverse environmental outcomes from rising global carbon emissions. (submission 2, p.2)

In contrast, the Plastics and Chemical Industries Association (submission 11, p. 4) believes that it is inappropriate to base the scheme cap on the Kyoto Protocol target; rather, the scheme should be flexible enough to accommodate a range of constraints over the next several decades.

The Total Environment Centre (submission 17, p. 5) argued that the cap should be set beyond the current Kyoto period to at least 2025, and that it should be set at a level that drives best practice low-emission technologies into the market and ensures that carbon-intensive infrastructure is retired at the end of its economic life.

International Power argued that:

Any cap on stationary energy must be set in the broader national and international context. It must be set in a dynamic manner in response to economic growth, technological developments, current circumstances and international developments/agreements at the time. To set a fixed target is problematic as it is bound to be inappropriate (too high/too low) in the medium to longer term. (submission 23, p.16)

More generally, Energy Australia (submission 15, p.3) noted that scheme caps should be set against medium- to long-term targets, to deliver regulatory certainty and encourage new investment in emission-reduction capacities.

A number of stakeholders supported the overall scheme cap being set in the context of a long-term target to reduce emissions by 60% by 2050 compared with 1990 levels.<sup>37</sup> For example, Insurance Australia Group noted that:

The best approach for setting an emissions cap is to start with an ‘aspirational’ target of a 60% reduction by 2050 and work backwards to set interim targets. Interim targets should allow for an increasing rate of progress, but should also be aligned with the need to achieve significant reductions in the short term. These targets could be reviewed every 5–10 years to ensure they are still in line with the most up to date scientific understanding. (submission 10, p. 3)

Origin Energy commented that:

In the event that the scheme commenced in 2008, Origin would support a cap from 2008–12 in line with the current Kyoto target. Beyond 2012, we believe that the cap should be set by looking forward to an aspirational target, for example 2050 (dictated by scientific evidence with respect to potential climate change impacts), with milestone goals by decade. (submission 52, p.11)

Several stakeholders identified options for overall caps to underpin the achievement of the long-term target (Table 3-1).

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<sup>37</sup> Insurance Australia Group, Institute of Actuaries of Australia and environmental groups (Climate Action Network Australia, Total Environment Centre and Australian Conservation Foundation).

**Table 3-1: Stakeholder views on caps**

Stakeholder	Proposed caps
Climate Action Network Australia (submission 17, p. 3), World Wide Fund for Nature (submission 41, p. 2) and Australian Conservation Foundation (submission 50, p. 5)	Cap to achieve a 20% reduction by 2020 (relative to 1990 levels). The cap should then be progressively lowered to achieve emissions reductions of at least 60% by 2050 (relative to 1990 levels).
Renewable Energy Generators Australia (submission 38, p.5 )	'Gateways' or cap ranges (for example, 10 to 20% by 2020, 20 to 35% by 2035) should be used to underpin a cut of 60% below 1990 levels by 2050.
Business Council for Sustainable Energy (submission 24, p. 5)	In the longer term the minimum commitment would need to (at the very least) stabilise emissions and honour the NSW Government's commitment to reduce greenhouse emissions to 2000 levels by 2025.
Sustainable Solutions (submission 1, p. 5)	The cap to 2012 should deliver a 5% reduction in energy-related emissions, although in reality the outcome may be more like a stabilisation of all energy-related emissions at 2003 levels. Beyond 2012, the cap should reduce at a rate of 2% of 1990 energy-related emissions per annum. This preliminary trajectory should lead to a 50% cut in emissions levels by 2050 compared with 1990 levels. More aggressive reductions may actually be required.

### 3.1.7 Indicative scheme caps

The levels of the overall scheme cap and cap trajectories are critical design issues that require both considered and robust analysis, and there would be an opportunity for stakeholder comment before decisions were made. The following discussion of indicative scheme caps is an important first step to inform such analysis and feedback. Following further stakeholder input and analysis a final position on these design elements would be set out for consideration by State and Territory Governments.

This section sets out an indicative range of scheme caps, for the purposes of public consultation, and on the basis that the scheme could commence by 2010.

These indicative caps:

- **Relate to the period 2010–30:** This is consistent with the possible scheme start date of 2010 with firm annual caps for the first 10 years of the scheme (2010–19), as well as a range of possible future caps for the following decade (2020–29).
- **Cover only emissions from electricity generation:** As discussed in Chapter 2, it is proposed to commence with electricity generators and expand to stationary combustion of gas, oil, coal and other fossil fuels, along with fugitive emissions from gas transmission and distribution, 5 years following scheme commencement. At the point that the scheme was expanded beyond electricity generation, the cap would need to be adjusted to reflect the additional emissions covered. The way in which this expanded coverage would need to be taken into account in setting caps is discussed in Section 3.2.

Initial stakeholder feedback on caps (Table 3-1) informed the selection of potential scheme caps for modelling purposes. Additionally, one ‘sensitivity’ assessment of the impact of introducing complementary measures such as additional offsets, enhanced energy conservation and induced technological change was modelled.

Given data limitations on future emissions projections and the scope to reduce emissions, *indicative* caps have been set for greenhouse gas emissions in the electricity generation sector only. The level of the increase in the scheme cap to accommodate the proposed inclusion of emissions from stationary energy combustion of coal, oil, gas and other fossil fuel emissions, along with fugitive emissions from gas transmission and distribution, potentially by 2015, has not been determined at this stage because a greater level of certainty in their emissions data is required.

The *indicative* scenarios modelled include:

- **Scenario 1:** Under this scenario, electricity generation emissions are capped at 176 Mt in 2030, which is approximately the level of electricity generation emissions in 2000. It represents a 33%, or 88 Mt, reduction on forecast business as usual emissions for this sector in 2030.
- **Scenario 1a:** This scenario is a sensitivity on Scenario 1 that assumes the same cap (176 Mt), but with higher levels of energy efficiency, biosequestration offsets and induced (demand side) technological change. The main purpose of this scenario is to illustrate the extent to which the costs of reducing emissions could be mitigated with complementary measures. It is noted that additional policy measures would be required to deliver the amounts of energy efficiency assumed in this sensitivity scenario.
- **Scenario 2:** Under this scenario, electricity generation emissions are capped at 150 Mt in 2030, which is approximately the level of electricity generation emissions in 1997. It represents a 43%, or 114 Mt, reduction on forecast business as usual emissions for this sector in 2030.



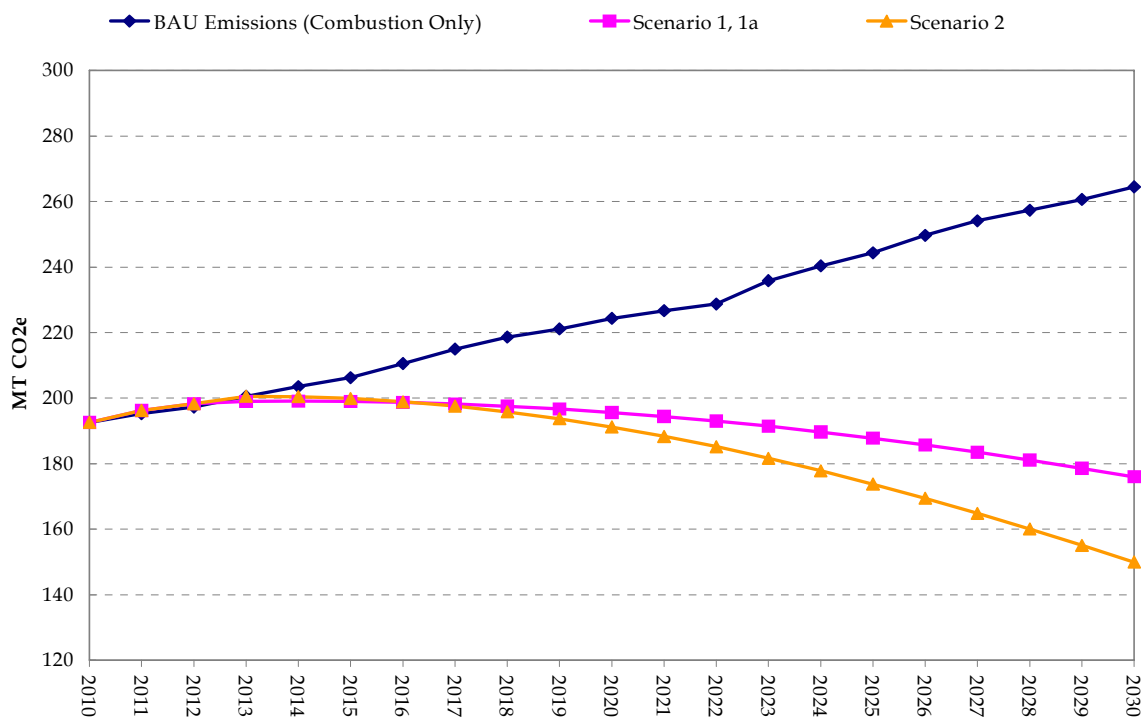
Figure 3-2 shows the *indicative* caps compared with projected electricity generation emissions under business as usual.

In all scenarios, the annual caps for the period 2010–12 are set in line with business as usual projections (with existing measures taken into account). This proposed approach recognises that Australia’s Kyoto target has been in place for almost a decade and is well known and understood, and that policies and measures are already in place to deliver that target.

For the remainder of the period of firm caps (2013–19), the trajectory of the cap in all scenarios aims to provide for a smooth transition to the respective overall caps in 2030. This approach recognises that the energy sector cannot be transformed overnight—it takes time for the existing stock of capacity to be rolled over and for the economy to transition to a lower carbon intensity.

Figure 3-2 shows that Scenario 2 provides for slightly more stringent caps from 2018–19 onward than does Scenario 1. Nevertheless, both scenarios recognise that significant opportunities for substantial reductions in emissions would not be available until after 2020, when major new investments in base load capacity will be required. Neither scenario contemplates cap trajectories that would result in the widespread early retirement of existing generation plant.

**Figure 3-2: Indicative scheme caps for the electricity generation sector**



Source: MMA (2006), *Impacts of a National Emissions Trading Scheme on Australia’s Electricity Markets*

As discussed above, gateways are proposed for the second decade of the scheme (2020–29). Scenarios 1 and 2 are presented as indicative upper and lower gateways, respectively, to stimulate comment from stakeholders.

Setting a more aggressive lower gateway to 2030 than the *indicative* Scenario 2 could deliver significantly greater abatement. At the same time, however, this could result in a larger impact on the economy as existing generation plant is retired early and new low emission plant is not commercially available. Given that a number of existing generators would be due to retire shortly after 2030 in any event (representing opportunities to replace this plant with less emissions-intensive plant), setting more stringent targets than this before 2030 might be premature.

Conversely, setting a less stringent upper gateway than the *indicative* Scenario 1 could further reduce the impacts on the economy, but it would require more drastic reductions in emissions in the future if Australia is to be on a path to reducing greenhouse gas emissions by around 60% compared to 2000 levels by the middle of the century. A less stringent gateway to 2030 might also send inappropriate signals to investors in the electricity sector and might cause plant to be built that would have difficulty in adjusting to steeper abatement requirements in future years.

All the *indicative* scenarios modelled include opportunities for the use of domestic offsets (that is, emission reductions that are achieved outside the covered sector of the NETS that can be used for compliance by liable parties to the scheme; see Chapter 5). Offset credits would have values equivalent to permits in the emissions trading scheme, and their inclusion would be expected to reduce the overall costs of meeting any given cap level. Scenario 1a models the additional take-up of biosequestration offsets compared to Scenario 1 to illustrate the impact of these measures (see Chapter 6).<sup>38</sup>

The estimated impacts of Scenarios 1 and 2 on the electricity market and the broader economy are presented in Chapter 6. This analysis includes an examination of the sensitivity assessment (that is, Scenario 1a).

*Stakeholder comment is sought on:*

- *the appropriateness of firm annual scheme caps for electricity generation emissions within the bounds of Scenarios 1 and 2 during 2010–19*
- *the appropriateness of Scenarios 1 and 2 as the basis for potential upper and lower gateways, respectively, for electricity generation emissions during the period 2020–29.*

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<sup>38</sup> Scenarios 1 and 2 assume modest amounts of biosequestration approaching 3.5 and 5.9 Mt p.a. respectively at 2030. Biosequestration offsets rising to 14 Mt p.a. at 2030 were assumed to be available under the sensitivity simulation (Scenario 1a).

## 3.2 Adjusting the cap for increased scheme coverage

If a decision were made to expand the coverage of an emissions trading scheme, then the scheme cap might need to be increased to reflect the additional emissions covered. Otherwise, the stringency (and cost) of the scheme could increase, because under the expanded scheme a larger group of liable parties would be competing for the same level of permits issued under the original cap to cover their emissions.<sup>39</sup>

As discussed in Chapter 2, comment is sought on the proposal that scheme coverage begins with electricity generation emissions in 2010 and expands in 2015 to include emissions from the stationary combustion of gas, oil, coal and other fossil fuels, along with fugitive emissions from gas transmission and distribution. At any time scheme coverage is expanded (see Section 2.5.1), a number of key factors would need to be considered in adjusting the scheme cap, including:

- **Consistency with overall objectives:** The setting of the adjusted caps would need to be consistent with the considerations outlined in Section 3.1.1.
- **Future emissions projections:** When any additional sectors are covered under the scheme, the projected emissions from these sectors under business as usual would need to be estimated for the duration of the scheme to understand the patterns of emissions growth compared with those of the covered sector. For example, it is proposed to add emissions from stationary combustion of gas, oil, coal and other fossil fuels, along with fugitive emissions from gas transmission and distribution, to the scheme's coverage, potentially by 2015. To do so, the projected emissions for these sectors would need to be estimated and compared to those for electricity generation. It should be noted that the information base underlying these projections is understood to be of poorer quality than that for electricity generation, and projections to 2030 are not currently available.
- **Scope to reduce emissions:** The availability and cost of abatement opportunities in the additional sectors would need to be assessed to determine the potential impact on permit prices and abatement. Such estimates would need to be developed to inform the adjustment of the scheme cap.
- **Impact on the permit market:** The impact on permit prices and abatement costs would depend on the stringency of the abatement task and the scope to reduce emissions through the inclusion of the additional sectors. To the extent that permit

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<sup>39</sup> The European Commission is currently considering expanding sectoral coverage within the EU ETS during the second phase to include aviation (see: <http://www.europa.eu.int>). The analysis to date has not contemplated increasing the scheme cap because aviation emissions are expected to represent a relatively small percentage (less than 1%) of total demand for allowances during the second phase of the EU ETS (2008–12). As a result, the inclusion of the aviation sector is expected to have a minor impact on the permit prices.

prices would rise as a result of the expanded coverage, liable parties with cost-effective mitigation opportunities would gain, whereas liable parties that were permit buyers, both before and after the expanded coverage, would face higher costs. The year 2015 coincides with the earliest potential time of the proposed scheme review (see Chapter 8) and, as mentioned above, the proposed announcement of additional firm caps and gateways. To the extent that these events and the proposed adjustment of the scheme cap to accommodate additional sectors would cause volatility in permit prices, such volatility would need to be mitigated because it would discourage investments in emissions reductions by making them more risky.

It is proposed that the trajectories of any expanded caps would follow the paths proposed in Figure 3-2 over the period 2015–30.

As previously discussed, given the data limitations on future emissions projections and the scope to reduce emissions, the level of the adjustment to the scheme cap to accommodate the proposed inclusion of emissions from stationary combustion of gas, oil, coal and other fossil fuels emissions, along with fugitive emissions from gas transmission and distribution, has not been determined at this stage. Stakeholder comment on this issue is invited.

To help inform this feedback, stakeholders may wish to consider emissions from electricity generation and direct combustion emissions in 1997 and 2000, which could be seen as *indicative* overall caps for Scenarios 2 and 1, respectively, in 2030 (Table 3-2).<sup>40</sup>

As discussed in Chapter 9, the Commonwealth and all State and Territory Governments are currently working on ways of streamlining emissions monitoring and reporting, to develop a nationally consistent approach. If the NETS was to commence in 2010, State and Territory Governments would require emissions reporting to be mandatory (above certain thresholds) by no later than 1 January 2008. It is envisaged that this process would generate valuable starting-point information on emissions from stationary combustion of gas, oil, coal and other fossil fuels, along with fugitive emissions from gas transmission and distribution. Such information would help determine the way in which these additional emissions would need to be taken into account in adjusting the caps.

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<sup>40</sup> Electricity generation emissions in Scenario 2 are capped in 2030 at around the same level as that sector's emissions in 1997. Emissions in Scenario 1 are capped in 2030 at around the same level as that sector's emissions in 2000.

**Table 3-2: Stationary energy emissions**

	<b>Electricity generation Mt</b>	<b>Direct combustion Mt</b>	<b>Total stationary energy emissions Mt</b>
1997	153	75	228
2000	176	78	254
2005	186	85	271
2010	191	94	274
2015	204	103	307
2020	222	112	333

Source: AGO 2005, *Stationary Energy Sector Greenhouse Gas Emissions Projections 2005*

Note: Emissions for 1997 and 2000 are actual emissions. Emissions in 2005, 2015 and 2020 are forecast business as usual emissions. Actual electricity generation and direct combustion emissions in 2004 were 195 Mt and 85 Mt respectively. Further work is required to separate out emissions from the stationary combustion of gas, oil, coal and other fossil fuels emissions from this total.

Additional work is also required to assess the potential for expanded scheme coverage to cause the price of permits to change and to determine the potential magnitude of the change. This work would be undertaken as part of the additional modelling of scheme caps proposed in Section 3.1.7.

*Stakeholder comment is sought on the proposed approach to adjust the scheme cap to include additional sectors.*

### **3.3 Banking and borrowing**

Emissions from liable parties are likely to vary from year to year because economic activity is cyclical. At the same time, the costs of abatement may vary over the duration of the scheme. Liable parties could better manage these issues if they were entitled to bank (excess) current allowances for future compliance periods.

If a decision is made to include banking as part of the scheme design, then a decision is required on whether it should be restricted. Unrestricted banking would allow liable parties to take advantage of any lower-cost abatement options in early years and thus avoid higher abatement costs in later years. This has the effect of increasing permit prices in the early years, but lowering them in later years (compared with no banking).

Unrestricted banking could create some practical challenges when linking trading systems. The concern is that if a country builds up a large number of banked units before linking,

there is a risk that these units may not be recognised under the new international agreement. However, although bilateral linking may be desirable in the longer term, the principal objective of designing a NETS is to establish a strong domestic market that meets Australia's greenhouse aspirations at least cost (Chapter 12). Furthermore, this issue is likely to be addressed in any transition to bilateral linking.

Restrictions on banking, on the other hand, can guard against the excessive use of banked allowances in any single compliance period. From an environmental perspective, however, this is not a concern for climate change because the environmental problem is caused by total accumulation of greenhouse gases in the atmosphere.

Stakeholder submissions overwhelmingly supported unrestricted banking. Indeed, most trading schemes operating around the world today allow for unrestricted banking (Table 3-3).

On balance, it is proposed that the scheme allow unrestricted banking on the basis that it could provide compliance flexibility, encourage early emission reductions and reduce compliance costs. Stakeholder views are sought on this approach, such as whether any limits on banking (such as banking in 10-year blocks) would be desirable.

Borrowing enables liable parties to bring forward allowances from a future compliance period to meet a compliance obligation in an earlier period. As with banking, borrowing provides compliance flexibility and can help smooth out volatility in allowance prices. The potential downsides of borrowing are that emission reductions are delayed and there is a greater risk of future non-compliance if the liable party cannot repay the borrowed allowances (for example, risk of company insolvency). For this reason, the NSW Generators (submission 42, p.12) argued against allowing borrowing.

There is little experience with borrowing outside Australia (Table 3-3). The EU ETS allows for limited borrowing within phases of its scheme, but not between phases. Under the United States sulphur dioxide scheme, issues of allowance shortfalls are accommodated by the market through forward contracts. This means that parties to the transaction, rather than the environment or taxpayers, bear the risk of default.

There is no reason to believe that market solutions would not be effective in Australia. Therefore it is proposed that the scheme not allow any borrowing.

*It is proposed that:*

- *banking should be unrestricted (although comment is sought on whether any limits on banking, such as banking in 10-year blocks, would be desirable).*
- *no borrowing should be allowed.*

**Table 3-3: Trading schemes: banking and borrowing requirements**

<b>Scheme</b>	<b>Banking</b>	<b>Borrowing</b>
Kyoto Mechanism	Banking of CDM and JI credits (CERs and ERUs) is limited to 2.5% of the Assigned Amount Units (AAUs) allocated to Kyoto Parties. Banking of AAUs is unrestricted.	Borrowing not allowed.
EU ETS: phases, 2005–07 and 2008–12	Allowed within, but not between, the two phases. Unrestricted after 2012.	Allowed within, but not between, the two phases.
US Sulphur Dioxide Scheme	Unrestricted	Not allowed
RGGI: phases, 2010–15 and 2016–20	Unrestricted	Not allowed
Chicago Climate Exchange (CCX): pilot phase, 2003–2006	Limited in 2003, otherwise unlimited during the pilot phase.	Not allowed
MRET	Unrestricted	Limited: liable parties are given a leeway of up to 10% to cover variability in the availability of renewable energy certificates.
Queensland 13% gas scheme	Allowed, but certificates have a limited life (3 years).	Not allowed
Victorian Renewable Energy Target	Unrestricted	Not allowed
NSW & ACT GGAS	Unrestricted	Limited: 10% shortfall allowed without penalty so long as shortfall made up the following year.

### **3.4 Conclusion**

The issue of determining an ‘appropriate’ level for the overall scheme cap that best meets the objectives of the NETS is undoubtedly one of the most difficult design issues to be addressed. Uncertainties regarding international climate change negotiations, climate change science and economic and technological developments make cap-setting a challenging exercise.

The proposal to set firm annual caps for 10 years, and a range of possible future caps for 10 years beyond that, is designed to strike an appropriate balance between providing investors with a sufficient level of certainty to make investments, while at the same time providing governments with the flexibility to respond to future uncertainties.

The levels of the overall scheme cap and the trajectory of annual caps are critical design choices that set the abatement task and significantly affect other scheme design elements. This issue requires considered analysis and appropriate opportunity for stakeholder comment. *Indicative* overall scheme caps for electricity generation emissions have been presented in this Chapter to inform such analysis and feedback. Further stakeholder input and modelling would be required before any decisions on caps could be made.

At any time that scheme coverage is expanded, a number of key factors will need to be considered in expanding the scheme cap. These factors include consistency with scheme objectives, forecast emissions and scope to reduce emissions from the additional sectors, and the impact on the permit market. Given data limitations on future emissions projections and the scope to reduce emissions, the level of the increase in the scheme cap to accommodate the proposed inclusion of emissions from stationary combustion of gas, oil, coal and other fossil fuels emissions, along with fugitive emissions from gas transmission and distribution, has not been determined at this stage. Stakeholder comment is invited on this issue, and indicative estimates of the expanded cap in 2030 have been provided in Table 3-2 to help inform such feedback.

The proposal to allow unrestricted banking would provide scheme participants with compliance flexibility, encourage early emission reductions and reduce compliance costs, while also enabling a smooth transition path for permit prices. Stakeholder views are sought on this approach, such as whether any limits on banking would be desirable.

It is proposed that the scheme should not allow borrowing, because it is assumed that market solutions such as forward contracts can effectively accommodate any shortfalls.



## **4 Penalty and make-good provisions**

*This Chapter examines the role of penalty and make-good provisions in enforcing compliance with the NETS cap. Penalties can be used to set a price cap on emission permits and the overall cost of the scheme.*

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### **4.1 Compliance with the scheme cap**

Compliance with the scheme cap can be encouraged by applying a penalty in the event that a scheme participant has insufficient permits to cover its emissions during a compliance period. The penalty can potentially serve two important purposes:

- encouraging compliance, and thus promoting the environmental integrity of the scheme
- capping the cost of compliance and providing certainty to investors about the maximum costs of the scheme.

An additional incentive to meet the cap and maintain the environmental integrity of the scheme could be provided through the use of a ‘make-good’ provision, which requires a scheme participant that exceeds its emissions cap to pay a penalty, as well as to surrender an equivalent number of permits.

This Chapter sets out proposals in relation to the penalty level and discusses whether a make-good provision should be included in the scheme design.

### **4.2 Penalty**

#### **4.2.1 Level of penalty**

To induce liable parties to comply with the scheme, the level of the penalty must be set at least as high as the marginal cost of abatement (which will determine permit prices), taking into account any transaction costs associated with compliance. If the penalty were lower than this, then it would be cheaper for a liable party to pay the penalty than to comply. This would limit the effectiveness of the scheme in reducing emissions.

Setting the penalty at an appropriate level to encourage compliance is likely to be more art than science. This is because the future costs of achieving an emissions cap can be estimated, but never known in advance. Modelled costs and actual costs could vary for a large number of reasons, including changes in fuel costs, technology costs, energy demand, or unrelated incentives to invest in different types of technology.

Setting a high penalty level is likely to encourage compliance, since compliance would be cheaper than paying the penalty. However, it raises a practical credibility problem: if a scheme participant were threatened with insolvency if it were required to pay a very high penalty, would governments actually enforce that penalty?

Conversely, low penalties have their own risks. First, they are less likely to induce compliance than high penalties unless they are coupled with a criminal penalty or unless they are in addition to the need to make up the shortfall. This is because the actual cost of compliance could rise beyond the level of the penalty, and it would be cheaper for scheme participants to pay the penalty than to comply. This could give greater certainty to investors in relation to future compliance costs, as they would be capped to a certain amount. However, this raises its own credibility issue: if the penalty were consistently found to be too low (that is, it induced too little abatement), then governments could raise the penalty. Should this occur, the investment certainty created by a low, pre-set penalty would be more apparent than real.

The level of the penalty could also be tiered. For example, lower penalties could be set for firms that breach their obligations by a small margin, with higher penalties applying to firms with more serious breaches. In addition, quite different penalties could be appropriate for offences other than failing to surrender permits, such as providing false and misleading information to the Scheme Regulator (see Chapter 8 for further detail on institutional arrangements).

In Australia, the penalties for the MRET, VRET, the NSW and ACT GGAS and the Queensland 13% Gas Scheme are similar to compliance costs (either estimated or real). This appears to be because a large emphasis has been placed on the role of the penalty in capping ultimate compliance costs. To date, the level of compliance under those schemes has been very high.

In the United States, to create powerful incentives for compliance, penalties for the SO<sub>2</sub> Allowance Trading and over-the-counter (OTC) Regional NO<sub>x</sub> Trading Programs have been notionally set at three times the cost of an allowance. Compliance levels of 99.9% have been achieved to date under both programs.

In the EU ETS, the Phase I (2005–07) penalty is €40 per tonne of CO<sub>2</sub>, rising to €100 per tonne of CO<sub>2</sub> for Phase II (2008–12). That penalty appears to reflect a greater emphasis on ensuring compliance, rather than on capping compliance costs.

The tax treatment of penalties compared with the purchase of permits must be also taken into account. Penalties are not a tax-deductible business expense, whereas the cost of purchasing a permit would be considered a legitimate business expense. Therefore, a firm would be prepared to spend more on a permit than the nominal penalty level—assuming that the firm was in a tax-paying position.

Finally, if a scheme implemented in Australia were ever bilaterally linked with an international scheme, then penalties in the Australian scheme ideally should be related to the level of the penalty in the international scheme. This is because penalties set a cap on the prices of permits—if the cap on prices is different across countries, then the country with the lower penalty might tend to export permits and risk breaching its emissions cap. It is important to note, however, that this would occur only if the price of permits was above the domestic penalty level but below the international penalty level.

#### **4.2.2 Form of penalty**

The penalty may take a civil or criminal form, depending upon the severity of the caps imposed. For example, if non-compliance were made a criminal offence it could result in a criminal record and jail sentences. In terms of perceptions, a civil penalty is likely to carry much less of a stigma than a criminal penalty. Therefore, if a criminal penalty were set at, say, \$20/t CO<sub>2</sub>-e, a firm might be expected to pay significantly more than \$20 for a permit to avoid a criminal conviction. Put simply, a criminal sanction is likely to have a greater deterrent effect than its civil penalty counterpart.

In Australia, the tradable certificate schemes currently in operation all adopt civil penalties for the offence of failing to surrender sufficient certificates. In some instances, criminal sanctions are also imposed for other offences. For example, the NSW and ACT GGAS legislation makes it a criminal offence to obstruct the GGAS Scheme Administrator and provides for a maximum penalty, including a 6-month prison term. Giving false or misleading information carries a maximum penalty of 12 months' imprisonment under MRET scheme legislation, and improperly creating certificates carries a maximum penalty of 6 months' imprisonment under the Queensland 13% Gas Scheme legislation.

The EU ETS imposes a civil penalty for non-compliance and requires publication of the names of those scheme participants that are not in compliance. Additional administrative penalties also apply, such as for the operation of an installation without a permit or failure to comply with an enforcement notice, failure to comply with a monitoring and reporting condition, and fraudulent reporting. In Sweden and Ireland, severe infringements attract fines and imprisonment up to 1 and 10 years, respectively.<sup>41</sup>

In the United States, the SO<sub>2</sub> Allowance Trading program applies a civil penalty of US\$2,000 (1990 dollars), adjusted annually for inflation, for each ton of excess emissions above allowances held. The penalty for non-compliance in the OTC Regional NO<sub>x</sub> Trading Program is an allowance penalty at a ratio of three-to-one. In other words, for each ton of excess emissions, a source must submit three allowances to the regulating

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<sup>41</sup> European Environmental Agency 2006, *Application of the Emissions Trading Directive* by EU Member States, EEA Technical Report No. 2/2006.

authority. Non-compliance with monitoring, record-keeping and reporting requirements under the SO<sub>2</sub> Allowance Trading and OTC Regional NO<sub>x</sub> Trading Programs can also attract criminal penalties.

### **4.2.3 Stakeholder views**

A number of submissions in response to the Background Paper supported the use of the penalty as a price ceiling in order to provide economic certainty.<sup>42</sup> For example, the Energy Supply Association of Australia noted that:

... economic costs cannot be allowed to escalate out of control when the environmental costs of not meeting the target are unknown. (submission 55, p.9)

The Business Council for Sustainable Energy also argued:

... that a penalty price providing a price cap is of important reassurance to a community that is completely unfamiliar with the likely impacts of an emissions trading scheme and can help to address any potential misinterpretations that might emerge in the media and other sources. (submission 24, p.79)

The Australian Wind Energy Association (submission 40, p. 8) commented that the penalty should be set a level that does not significantly limit economic growth, reflects the technical and commercial potential of abatement, and requires Australia to improve its emissions intensity per unit of Gross Domestic Product.

By contrast, environmental groups<sup>43</sup> generally argued that high penalties should be used to ensure compliance, rather than to cap compliance costs. For example, Environmental Defender's Office NSW (submission 49, p. 20) argued that capping costs would benefit participants but could undermine the environmental integrity of the scheme.

### **4.2.4 Assessment**

As noted above, determining the level of the penalty is not a clear-cut exercise. Setting the penalty just above the estimated costs of compliance would value capping the costs of the scheme more highly than absolute compliance with the cap, and *vice versa* for penalties that are multiples of that estimated cost.

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<sup>42</sup> The Energy Users' Association of Australia, Energy Supply Association of Australia, Origin, Queensland Resources Council, Loy Yang Marketing Management Company, Australian Industry Greenhouse Network and Sustainable Solutions.

<sup>43</sup> Australian Conservation Foundation, World Wide Fund for Nature, Environmental Defender's Office NSW and Total Environment Centre.

It is proposed that the penalty be set at a level that caps the cost of the scheme at an acceptable level but also encourages compliance. This approach best meets the scheme objectives outlined in Chapter 1 and is consistent with the 10 key design propositions.<sup>44</sup> In particular, it provides investor certainty by allowing investors to make decisions in the knowledge of an upper limit on future compliance costs. In this way, the potential impacts on the economy are also minimised because it allows for the overall scheme costs to be capped if economic and emissions growth are higher than expected.

At the same time, the level of the penalty would be set to avoid a shortfall in abatement and thereby maintain the environmental integrity of the scheme. Clearly, robust estimates of future compliance costs are required at the outset of the scheme to avoid the environmental integrity of the scheme being compromised.

It is proposed that the scheme apply a civil penalty for non-compliance, underpinned by a provision to publish the names of participants that are not in compliance. Should non-compliance become an issue in the future, and a greater deterrent become required, then a criminal sanction could be considered at some future time.

A penalty level has not been determined at this stage. It will be set once the scheme cap and corresponding compliance costs have been determined (that is, following public consultation on the Discussion Paper and further modelling).

*It is proposed that:*

- *the penalty should be set a level that caps the cost of the scheme at an acceptable level but also encourages compliance*
- *a civil penalty should be applied for non-compliance.*

### **4.3 Make-good provision**

A make-good provision, whereby scheme participants need to purchase permits to make up any shortfall in addition to paying the penalty, can provide an additional incentive (and cost) to ensure that the overall emissions cap is achieved.

Make-good provisions are not a feature of trading schemes operating in Australia. In contrast, the EU ETS design includes a make-good provision.

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<sup>44</sup> Proposition 7 of the 10 key design propositions stated that a penalty should be set to encourage compliance and to establish a price ceiling for the permit market.

Similarly, in the United States, the SO<sub>2</sub> Allowance Trading and OTC Regional NO<sub>x</sub> Trading Programs are designed to ensure that the cap is met, and they have one-to-one and three-to-one make-good provisions, respectively.

#### **4.3.1 Stakeholder views**

A number of submissions (mainly renewable generators and environmental groups) supported the inclusion of a make-good provision to preserve the environmental integrity of the scheme.<sup>45</sup> A number of those submissions also noted that if future international agreements were to involve binding quantity targets (such as those under the Kyoto Protocol), the use of a make-good provision would avoid the need for taxpayers to buy international credits to make up the difference in any shortfall.

The Centre for Energy and Environmental Markets (submission 59, p. 26) also argued that the absence of a make-good provision in the design of an Australian emissions trading scheme could raise some practical challenges to linking with the EU ETS. In particular, by adopting less stringent sanctions the Australian emissions trading scheme could put the environmental outcomes under the EU ETS at risk.

In contrast, several stakeholders<sup>46</sup> argued against a make-good provision on the grounds that it would increase the economic uncertainty of the emissions trading scheme. For example, Origin Energy (submission 52) argued that the penalty should be set to avoid shortfalls, and if compliance becomes a concern, governments could review the scheme parameters.

#### **4.3.2 Assessment**

It is not proposed to include a make-good provision. To do so would mean that the future cost of compliance would be uncapped. This would significantly reduce the certainty available to investors. It would also increase the risk of large, sudden impacts on the economy.

As discussed above, the environmental integrity of the scheme could still be maintained by setting a penalty that encourages compliance. The need for a make-good provision could also be revisited at the time of the proposed scheme review (Chapter 8) should compliance become a concern.

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<sup>45</sup> Australian Conservation Foundation, World Wide Fund for Nature, Australian Wind Energy Association, Environmental Defenders Office, Renewable Energy Generators Australia, Hydro Tasmania, Insurance Australia Group, Western Australian Water Corporation, Total Environment Centre and Centre for Energy and Environmental Markets.

<sup>46</sup> Origin Energy, NSW Generators, AGL, International Power, NRG, and Loy Yang Market Management Company.

The absence of a make-good provision could present some potential challenges to a bilateral link with the EU ETS (Chapter 12). However, although it is acknowledged that bilateral linking may be desirable in the longer term, the principal objective of designing a NETS is to establish a strong domestic market that meets Australia's greenhouse aspirations at least cost. Additionally this issue could be addressed in any transition to bilateral linking.

*It is proposed that the scheme should not include a make-good provision.*

## **4.4 Conclusion**

A rigorous compliance regime is critical to guaranteeing the integrity of any emissions trading scheme and is central to the enforcement of the imposed cap.

In designing a NETS it is proposed that a civil penalty be set at an appropriate level to cap the price of emission permits and the overall cost of the scheme at an acceptable level, and encourage compliance.

The proposed compliance regime strikes an appropriate balance between meeting the needs of the economy and the environment.

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## 5 Offsets

*The term 'offset' is used to describe a reduction or removal of greenhouse gas emissions that counterbalances emissions elsewhere in the economy. Offsets allow low-cost abatement outside of the capped sector to be recognised and used for compliance under the NETS. This improves the efficiency of the scheme and reduces the overall cost to the economy in achieving the same level of abatement.*

*Various issues have been considered in designing the broad architecture of an offsets regime, including consistency with international frameworks, additionality, measurement, transaction costs, baseline setting and monitoring, and what types of offsets should be eligible under the NETS.*

*This Chapter provides an overview of the offsets regime proposed for inclusion in the NETS. It also includes an examination of priority areas for offset activities as well as mechanisms to expand the scope of the offsets regime in terms of further offsets activities in Australia and recognising credits from the CDM under the Kyoto Protocol.*

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### 5.1 Role of offsets in emissions trading schemes

Activities that offset greenhouse gas emissions can generate 'offset credits' when they comply with the requirements of a formal emissions trading scheme (that is, when the offset activity is certified as complying with the emissions trading scheme's offset rules). Therefore, the specific rules governing offsets under an emissions trading scheme determine the eligibility of various types of offset projects, how offset credits can be created, and the rights and responsibilities associated with offsets (that is, the property rights associated with the creation of offset credits).

Once created, an offset credit can be surrendered to make up the difference between a liable party's total emissions covered by the emissions trading scheme and the number of permits that it holds at the end of a compliance period.<sup>47</sup> Offset credits therefore have an emissions value equivalent to that of a permit in the emissions trading scheme (that is, 1 t CO<sub>2</sub>-e).

### 5.2 Why include offsets in the NETS?

One of the 10 key design propositions agreed in March 2005 by State and Territory Governments for further investigation was that 'Offsets be allowed'. The objective of including offset credits in the design of a NETS is to allow the cap to be reached at least cost. From an economic perspective, the total cost of reducing net emissions to a specified

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<sup>47</sup> These permits may be those that the firm was originally allocated, or those that they have subsequently purchased in the market.



level (the cap) will be minimised when the marginal cost of abatement across all sources and all sinks is equal.<sup>48</sup> This will also theoretically be equal to the cost of permits in the market.

The inclusion of offsets in the NETS would broaden the scope of the system to provide an incentive for activities that would not otherwise have been influenced by the price of greenhouse gas emissions in the permit market. In doing so, lower-cost abatement options outside the covered sectors can be substituted for higher-cost abatement options inside the covered sectors. Emissions reductions from offsets activities can then be used to ‘balance out’ emissions from the covered sector, leaving net emissions unaltered.

Offsets therefore provide a way to access low-cost abatement across a broader portion of the Australian economy, while at the same time acting as incentives for early activity in non-capped sectors that may, at some point in the future, be included under the coverage of the emissions trading scheme (see Chapter 2).

The benefits of using offsets to reduce the cost of meeting emissions targets is recognised in the Kyoto Protocol via the CDM and JI provisions. These mechanisms allow emissions obligations in one country to be met (at least in part) through reducing emissions in another country. Similarly, offsets have been incorporated into the design of a number of current, and proposed, greenhouse gas emissions trading schemes. These include the EU ETS<sup>49</sup>, the NSW and ACT GGAS,<sup>50</sup> the Chicago Climate Exchange<sup>51</sup>, the proposed RGGI<sup>52</sup> and the proposed Canadian Large Final Emitters Scheme.<sup>53</sup>

The majority of stakeholders supported the inclusion of some form of offsets regime within the NETS on the basis that it would help to lower the overall compliance costs for liable parties. Generally, supporters advocated that a wide range of offsets be made available. For example, the Business Council for Sustainable Energy’s submission states:

We can see no reason why offsets should not be recognised under the scheme provided they meet with IPCC [Intergovernmental Panel on Climate Change] accounting standards, and provide a secure form of abatement that is capable of being measured on a repeatable and accurate basis. Offsets increase the number of options available for realising cost-effective abatement and in the case of methane destruction is one the cheapest abatement options available in Australia. (submission 24, p.7)

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<sup>48</sup> Assuming zero transaction costs and no market power.

<sup>49</sup> The EU ETS, through the Linking Directive, allows certain CDM and JI credits to be used. In the first phase of the scheme, credits obtained from nuclear power generation, land-use change activities and forestry activities may not be used. This rule is being reviewed for the second phase of the scheme.

<sup>50</sup> Further information on project eligibility is available at [www.greenhousegas.nsw.gov.au](http://www.greenhousegas.nsw.gov.au)

<sup>51</sup> Further detail on eligible offsets is available at [www.chicagoclimateexchange.com](http://www.chicagoclimateexchange.com)

<sup>52</sup> Further details on projects is contained in the Model Rule available at [www.rggi.org](http://www.rggi.org)

<sup>53</sup> For further information on project eligibility go to [www.climatechange.gc.ca](http://www.climatechange.gc.ca)

Similarly, the submission from the Plastics and Chemical Industry Association states:

In PACIA's view, an emissions trading scheme should accommodate as broad a range of offsets as possible. The advantage of such an approach is that it provides maximum opportunity for achieving the most efficient means of emissions reductions and/or abatement. (submission 11, p.5)

Not all submissions supported the use of offsets. Notable exceptions included the WWF, the Australian Conservation Foundation and the Centre for Energy and Environmental Markets. The major concerns of these groups centred on the issue of permanence and measurability and the view that offsets may act to delay the restructuring necessary to achieve large cuts in emissions from the stationary energy sector. The submission from the Centre for Energy and Environmental Markets, for example, stated:

Including offsets such as carbon sinks will increase the complexity of the system and might have an impact on environmental integrity, as there can be relatively high uncertainty in measuring the carbon emissions abatement of many types of projects. More generally, project-based mechanisms generally require a 'baseline and credit' approach that is always problematic because it is inevitably counter-factual—that is, additionality is very hard to verify. (submission 59, p.11)

Whilst acknowledging these as issues that require specific attention, the Taskforce believes that an offsets regime can be designed to have a high level of accuracy and environmental integrity while at the same time providing low-cost abatement options for firms covered under the cap, as well as a useful incentive for firms that are to be covered under the cap in the future.

## **5.3 Key design considerations**

In designing the offsets regime for the NETS several factors have been addressed, including consistency with international frameworks, additionality, measurement, transaction costs, baseline setting and monitoring, eligibility of particular offset activities, and recognition of offsets from other regimes. Each of these key design issues is examined below.

### **5.3.1 Consistency with international frameworks**

There are two broad international climate change frameworks currently in place. The first and broadest is the UNFCCC, which was signed by Australia in 1992. The Commonwealth Government has recently announced that it will play a key role in formulating approaches to address climate change and push forward the objectives of the UNFCCC beyond 2012, through co-chairing the Dialogue on Long-term Cooperative Action on Climate Change.<sup>54</sup>

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<sup>54</sup> <http://www.deh.gov.au/minister/env/2006/mr19may06.html>

The second international framework currently in place effectively ‘operationalises’ the UNFCCC through the Kyoto Protocol, which includes three flexibility mechanisms. These are intended to help Parties in meeting their obligations and provide opportunities for other nations to develop in a more sustainable way. The first of the flexible mechanisms is Emissions Trading (which can occur between Annex B Parties). The second is the CDM, and the third is JI.

Both the CDM and JI mechanisms are project-based mechanisms whereby offset credits can be generated by undertaking project activities either within developing countries (that is, to produce CDM credits, known as CERs), or within developed countries that have taken on an emissions target by ratifying the Kyoto Protocol (that is, to produce JI credits, known as ERUs).

It is highly desirable that the approach to facilitating offsets projects within Australia be as consistent as possible with the emerging details of the JI mechanism. Reasons for this include:

- if Australia were ever to ratify the Kyoto Protocol, the transition between the NETS and being able to create credits under the JI mechanism would be much smoother
- Australian offsets projects are likely to be more credible in the eyes of the international community
- it could reduce transaction costs to the extent that methodologies and procedures that have already been tried and tested elsewhere could be applied in Australia
- it would be less confusing for companies that operate in multiple international jurisdictions.

The details of how the JI mechanism will be implemented are being finalised over the course of 2006. They include guidance on acceptable baseline and monitoring methodologies; appropriate levels of third-party scrutiny of offsets claims; and the eligibility of projects with respect to timing, uncertainty, and additionality.

The Joint Implementation Supervisory Committee (JISC) was officially formed at the UN Climate Change Conference in Montreal in late 2005. The JISC is tasked with investigating and developing JI rules and procedures, and is supported by Secretariat staff from the UNFCCC. The schedule of JISC work and meetings (for decision-making) over the 2006 calendar year is intense, and it is expected that much of the JI mechanism, as proposed by the JISC, will be accepted by Parties to the Kyoto Protocol at the annual UN Climate Change Conference in Nairobi in November 2006.

The decisions made at that meeting will provide important guidance for the exact structure, coverage, processes and rules for offsets projects within the NETS. UNFCCC staff have been contacted by the Taskforce Secretariat to discuss key issues and ensure that there is active communication during the detailed design of any offsets regime within the NETS.

*Consistency with the Kyoto Protocol, and hence the details of the JI mechanism, should be a key principle guiding the development of detailed rules governing offsets under the NETS.*

The sections below provide further detail on the proposed design of the offsets regime under the NETS, including consideration of additionality, baseline and monitoring methodologies, measurement and reporting, administration, and transaction costs. As many of the details around the JI mechanism are still emerging, some adjustments may be required to the proposed approaches as the implementation of the JI mechanism progresses at the international level.

*It is proposed that approaches to facilitate the development of offset projects and the creation of offset credits under the NETS be as consistent as possible with those emerging methodologies, rules and frameworks being developed for the JI mechanism under the Kyoto Protocol.*

### 5.3.2 Additionality

The key aim of an offsets regime is to provide an incentive for abatement that would not otherwise have occurred. That is, offsets should aim to promote ‘additional’ reductions in emissions compared with a ‘business as usual’ scenario. This is often referred to as the ‘additionality’ of an offsets project and is the subject of much debate amongst project proponents, scheme regulators, government officials and other commentators.

Most of the debate is based on problems with reliably translating the concept of ‘business as usual’ into quantified projections for emissions from a particular sector or project situation. Offset credits are essentially determined according to the difference between two scenarios—the project scenario and the baseline scenario (that is, the difference between ‘with’ and ‘without’ the project activities). This is an inherently difficult process, as the ‘without’ scenario, or ‘business as usual’, can never be known with 100% certainty. Establishing the additionality of an offset project is crucial if the environmental integrity of the scheme is to be maintained.

The concept of additionality can be split into three types, and each of these is explored in more detail below:

- environmental additionality
- regulatory/legal additionality
- financial/investment additionality (as a proxy for ‘motivation’).

All three types of additionality can be built into the structure and eligibility testing of the offsets regime for the NETS. This is made possible by the ability to reasonably assess the prevailing economics of potential abatement activities within the Australian context.<sup>55</sup> Clear and prescriptive project eligibility tests, specific to Australian sectors and activities, could be used to ensure that non-additional projects are identified and excluded from the offsets regime.

Environmental additionality is a test of whether the offsets project actually reduces emissions. This is closely linked with the establishment of baseline scenarios for individual projects and for project sectors, and can be effectively dealt with in the construction of specific rules for setting baselines and monitoring project activities.

Regulatory/legal additionality is a test of whether the offsets project is being undertaken simply to comply with existing legal and regulatory requirements, or whether it is in excess of those requirements. It is essential that existing legal and regulatory requirements be part of the eligibility testing for offsets projects to avoid the creation of offsets by projects that are already taking place in order to comply with prevailing laws and regulations.

Ensuring regulatory/legal additionality will involve choosing the appropriate ‘regulatory baseline’ for different types of projects. These baselines are likely to evolve through time as new laws are introduced and existing laws repealed.

Financial/investment additionality is generally taken to mean that the offsets project would not have taken place if revenue from the creation of offset credits were not available. That is, the project would not be a viable investment option in the absence of credit revenue, and an economically rational decision-making process would not have resulted in the project going ahead.

This type of additionality is quite difficult to test on a project-by-project basis, and it has a significant impact on the complexity of the offsets regime’s administration, as well as on

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<sup>55</sup> This means that it is possible to identify what would be the most likely activity under the ‘business as usual’ scenario in a variety of sectors. This can be then be used to define rules that will only allow additional projects to be eligible for offset credits. In contrast, the CDM covers over 100 developing countries and consequently a very wide variety of developing economic environments and ‘business as usual’ scenarios.

the transaction costs for project proponents.<sup>56</sup> Having to test financial/investment additionality on a project-by-project basis creates a situation whereby the eligibility of the offsets project depends on the project proponent's ability to demonstrate that the project is essentially a bad investment, or on the proponent's reluctance to undertake the project given the various barriers that exist.<sup>57</sup>

Several stakeholders stated that including a financial/investment additionality test in the NETS would significantly increase cost and complexity for project proponents, while at the same time introducing a high level of subjectivity in the assessment of project eligibility. It is therefore proposed that financial/investment additionality be addressed through careful design of project eligibility tests to avoid 'business as usual' projects being likely to be accepted, and that demonstration of financial/investment additionality on a project-by-project basis not be a requirement for recognition of offsets projects. However, as noted above, this position may be reviewed in light of emerging international approaches to the JI mechanism, domestic abatement activities and further stakeholder consultation.

*It is proposed that an offsets project under the NETS must be able to demonstrate that it reduces emissions beyond a plausible baseline and that it meets specific project eligibility tests, including the regulatory and legal requirements of the relevant jurisdiction. If this is possible, then the project would be deemed to be additional.*

*It is not proposed to specifically require the demonstration of financial/investment additionality on a project-by-project basis. Further input from stakeholders is sought on this issue.*

### 5.3.3 Baseline setting and monitoring

The baseline and monitoring methodologies used in the quantification of abatement provide the detail on how many offset credits could be generated by particular offsets projects. It is important for any offsets regime to clearly specify exactly how baselines should be developed for particular project sectors and individual projects, so that project

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<sup>56</sup> This impact has been clearly demonstrated by experience to date with the CDM. It should be noted that the CDM's Executive Board has been instructed by the Parties to the Kyoto Protocol to thoroughly review the use of additionality testing to improve the performance and penetration of the mechanism.

<sup>57</sup> Experience to date within the CDM (where there are requirements to demonstrate financial/investment additionality) has shown that this aspect of scheme administration adds an enormous amount to the transaction costs for project proponents. It is often a matter of subjective judgement in the context of complex business decision-making processes, rather than a matter of clear and objective tests that can be audited.

proponents can have a reasonable level of certainty around the expected number of credits that could be generated from their project activity.

As with other design considerations for offsets under the NETS, consistency with the approaches agreed under the JI mechanism will have a significant influence on the detail of baseline setting and monitoring that is developed as part of ongoing NETS design. This includes key issues such as additionality frameworks, crediting periods and baseline resetting, and required levels of accuracy.

In early 2006 the JISC released a draft of the *Criteria for Baseline Setting and Monitoring* for the JI mechanism and called for public input. It is expected that the JISC will make decisions on these Criteria at its fourth meeting, scheduled for the third quarter of 2006. The draft states that 'a baseline shall be established:

- on a project-specific basis and/or using a multi-project emission factor
- in a transparent manner with regard to the choice of approaches, assumptions, methodologies, parameters, data sources and key factors
- by taking into account relevant national and/or sectoral policies and circumstances
- in such a way that credits cannot be earned for decreases in activity levels outside the project or due to force majeure
- by taking account of uncertainties and using conservative assumptions.

One of the aspects of the JI mechanism that should be noted is that, unlike with the centralised approach used for CDM methodologies, Parties play a greater role in JI baseline work. Parties who have adequate greenhouse gas inventory systems are allowed to establish national guidelines for project approval, including the use of standardised baselines, and then use the UN approval processes if desired. This aspect of JI should provide the NETS with an appropriate level of flexibility in establishing and approving baseline and monitoring methodologies that are consistent with the JI mechanism but at the same time tailored to the specific Australian situation and the objectives of the scheme.

Generally, there are two approaches to establishing baseline and monitoring methodologies: top-down and bottom-up. The top-down approach involves defining clear and prescriptive rules for project proponents and the Scheme Regulator to use in determining whether an offsets project is eligible, and for the specific approach to quantifying abatement. The rules cover a number of different projects within a sector or sub-sector. This is the approach currently used in GGAS and is an emerging aspect of the CDM in the form of 'consolidated methodologies'.<sup>58</sup>

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<sup>58</sup> See <http://cdm.unfccc.int/methodologies/PAmethodologies/approved.html>

The bottom-up approach to establishing baseline and monitoring methodologies provides a mechanism for project proponents to come forward with their own baseline and monitoring methodologies for approval as eligible offsets. This has been the approach used for establishing CDM methodologies. Although it is a little more time consuming and costly, it has resulted in a wide variety of approved methodologies with an even larger number under consideration.

Both the top-down and bottom-up approaches provide positive outcomes, and it is possible for them to be combined in the NETS. It is proposed that a set of prescriptive rules be established for the priority sectors (see Section 5.4), providing a high level of certainty and predictability for offsets activities in those sectors. It is also proposed that a parallel mechanism be created to allow project proponents with offset projects outside of the priority sectors to come forward with project-specific baseline and monitoring methodologies for approval (see Section 5.5). This combination of approaches provides a greater level of certainty in the priority sectors and also provides an opportunity for new and innovative offset projects to qualify to participate in the NETS.

*It is proposed that baseline and monitoring methodologies for offsets activities under the NETS be established using a combination of top-down and bottom-up approaches.*

### **5.3.4 Measurement and reporting**

Measurement and reporting of emissions and removals is a relatively new field and is made considerably more complex by the fact that greenhouse gas emissions are very rarely measured in a traditional sense. Almost all quantification of emissions and removals is done via calculations, using key inputs and emissions factors to estimate the tonnes of CO<sub>2</sub>-e emitted (or not emitted) or removed. This process is inherently uncertain, and reducing that uncertainty to acceptable levels is a key objective for the ongoing development of measurement protocols.

Over the last 20 years good progress has been made in establishing consistent, robust and verifiable approaches to quantifying emissions and removals in a variety of sectors and project situations. Since the coming into force of the Kyoto Protocol and the establishment of the EU ETS this progress has accelerated significantly. Currently there are a number of standards, protocols and rules being used (and further developed) to help quantify emissions reductions and removals, and it is expected that these varying approaches will tend to converge over time. The most relevant of these in the Australian context are the IPCC, the JISC, the Australian National Greenhouse Gas Inventory (NGGI), the International Standards for Carbon Accounting (ISO 14064), relevant Australian Standards,



the protocols developed by the WRI/WBCSD ('Greenhouse Gas Protocol'), GGAS and Greenhouse Friendly.

However, it is important to note that the emissions or removals from different offsets projects require quite different approaches to quantification and have very different implications for uncertainty in those measurements. For example, the levels of uncertainty in the actual consumption of fuel (and the characteristics of that fuel) by an industrial process are quite different from the levels of uncertainty involved with the estimation of carbon stocks accumulated in a large and biodiverse forest, and different approaches must be used to deal with these different uncertainties.

A key challenge for the development of an offsets regime is to prescribe measurement and reporting protocols that balance the cost and practical aspects of measurement with the need for accurate assessment of abatement. (See Chapter 9 for more detail on monitoring, reporting and verification.)

*It is proposed that the measurement protocols for offsets projects under the NETS be developed with primary consideration of the guidance provided by the IPCC, the JISC, and the Australian NGGI, with further input from the International Standards for Carbon Accounting (ISO 14064), relevant Australian Standards, the protocols developed by the World Resources Institute / World Business Council for Sustainable Development ('Greenhouse Gas Protocol'), and the experience gained in the implementation and operation of GGAS and Greenhouse Friendly.*

### **5.3.5 Transaction costs and institutional arrangements**

The cost of developing and operating an offsets regime include the costs associated with the establishment and ongoing administration of the scheme, as well as project-related costs arising from project initiation and the sale of credits.<sup>59</sup>

In developing the possible design of the NETS, the NETT have considered the important role that efficient institutional structures play in minimising administration and project-related costs (see Chapter 8). They have also considered the need to strike a balance between the administrative cost of the offsets regime and the need to ensure that the environmental integrity of the NETS is maintained.

A key issue with transaction costs is 'liability': whether buyers or sellers should be liable if the emissions reduction is not real or if the sequestration is not maintained for the period

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<sup>59</sup> These transaction costs may include search costs, costs associated with contract negotiation, and any other duties or fees required to complete the transaction. They do not include the cost of abatement, but rather all 'other costs' associated with undertaking a transaction in the market.

specified by rules of the offsets regime. This is essentially a question of compliance: that is, will compliance be higher when buyers or sellers are liable for the release of carbon?

Under a ‘seller liability’ approach, regular monitoring would assess the accuracy of the emissions reductions or the state of the carbon stock against the credits issued against that stock. If differences arise, sellers have financial liability for the value of the abatements for which they have been credited but which are not real emissions reductions or are no longer contained in the sink. This is the approach that has been adopted by GGAS.

The use of seller liability is best suited to trading schemes where compliance mechanisms can be put in place that make non-compliance very unattractive and where institutions exist for enforcing compliance penalties.<sup>60</sup> Because buyers bear no risk under this system they are more likely to seek out opportunities to purchase cheap offsets, thus increasing the liquidity of the market and the efficiency of the emissions trading scheme in general.

‘Buyer liability’ would result in purchasers reducing the value they placed on credits from ‘risky’ projects. In addition, total transactions costs may well be higher under a buyer liability market, since both the regulator and the buyer would need to assess the validity of projects. Under a seller liability model, only the regulator needs to check.

*It is proposed that offsets providers under the NETS be liable for compliance with rules governing the creation of offset credits. That is, a seller liability model is proposed for offsets under the NETS.*

In any offsets regime there are two key institutional roles. The first role involves establishing eligibility requirements, defining methodologies to quantify offsets, and prescribing monitoring and verification systems to ensure compliance. The second role involves implementing and administering the regime in line with the rules provided. It is important that these two roles are separated for effective development and operation of the offsets regime. In this way the administrative processes are not encumbered with assessing the acceptability of methodologies or other subjective issues, and can operate more efficiently.

It is proposed that in the design of the NETS the first institutional role would be undertaken by the Scheme Developer and the Ministerial Council, whereas the second role would be filled by the Scheme Regulator, as detailed in Chapter 8.

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<sup>60</sup> Kerr, Suzi, 1998, *Buyer vs. Seller Liability: Improving the Credibility of Clean Development Mechanism Credits*, Manuscript, Motu: Economic and Public Policy Research, Wellington, New Zealand.

### **5.3.6 Energy efficiency, small-scale power generation and renewable energy projects**

The State and Territory Governments believe that energy efficiency, small-scale (low-emission) power generation and renewable energy projects have a crucial role to play in preparing Australia for a carbon-constrained future. The economics of these projects are likely to receive a boost from increases in energy prices resulting from the NETS, if it is implemented. This is in addition to the assistance from the various complementary measures that are currently in place (or being considered) to help in deployment of these technologies.<sup>61</sup>

It has been well documented that, in the Australian context, energy-efficiency initiatives represent relatively cheap greenhouse gas abatement, whereas small-scale power generation and renewable energy projects will play important roles in a low-emissions stationary energy sector in the future. However, in designing an emissions trading scheme where direct emissions from the electricity sector are capped, there is an inherent difficulty in allowing offsets to be created in the same sectoral scope as the liable parties. This is because any emissions reductions associated with small-scale (low-emission) power generation, renewable generation or energy efficiency have already been reflected in the emissions made by liable parties.<sup>62</sup>

For example, say a renewable energy generator creates a megawatt hour of electricity that ‘displaces’ a megawatt hour of production from a fossil fuel generator that is capped by the emissions trading scheme. This reduces production (and emissions) from the fossil fuel generator but it also reduces the number of permits that the generator needs to meet its obligations under the cap. That is, because less electricity is being produced from the fossil fuel generator, it requires fewer permits (all else being equal). Any ‘spare’ permits arising from the reduction in the fossil fuel generator’s production can be sold or banked for compliance in future periods.

If the renewable generator were to be provided with an offsets credit for the emissions that are avoided (that is, the renewable generator’s baseline is the emissions intensity of the fossil fuel generator), then the same emissions reductions are being counted twice: once by the generator that sells its excess permits (created when demand for its product is reduced) and once by the renewable energy generator that is awarded the offsets credit. An illustrative numerical example is provided in the box below.

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<sup>61</sup> For example, the MRET, Energy Savings Funds, State-based Renewable Energy Targets, etc. See Chapter 11 and Chapter 13 for further detail.

<sup>62</sup> This is not the case for emissions trading schemes where an intermediary (such as an electricity retailer) has an emissions liability based on ‘attributable’ emissions (rather than direct emissions). In this type of system, improvements in power generation and improvements in energy efficiency both can both be recognised as abatement without double counting.

### Example of double counting

Suppose 'Generator X' is a **fossil fuel generator** connected to the NEM and produces 100 MWh at an average intensity of 1 t CO<sub>2</sub>-e/MWh. Further, say Generator X has obtained 100 permits to cover its expected emissions (where one permit equals 1 t CO<sub>2</sub>-e).

Suppose that 'Generator Y', a **renewable energy generator**, begins operation and dispatches 2 MWh to the NEM. Generator Y's production displaces 2 MWh of Generator X's production in the NEM. Generator X now produces 98 MWh and Generator Y produces 2 MWh.

Because Generator X's production has declined, so too have its emissions and hence the number of permits required to meet its obligation under the scheme—it has two 'excess' permits that it can sell to another generator or bank for compliance in future periods.

If Generator Y were eligible to create offset credits under the scheme, then the number of offset credits it could create would be determined by the difference between its 'baseline emissions' and its 'actual emissions'. Since the power produced is going to the NEM, Generator Y's baseline emissions would be the emissions intensity of the energy that it 'displaces' (that is, 1 t CO<sub>2</sub>-e/MWh). Generator Y's actual emissions are zero, as it is a renewable energy generator. In this situation, the renewable generator would create two offset credits for production of 2 MWh of renewable energy.

If this were allowed, and offset credits were created for the production of renewable energy, then the associated emissions reduction is effectively being counted twice, resulting in four permits or offset credits being made available to the market as a result of the project, instead of two. Clearly this level of double counting would have an impact on the environmental integrity of the scheme.

The same situation would arise if **energy-efficiency projects** were allowed to create offset credits under the scheme.

Say a large electricity user implements energy-efficient measures that reduce the demand for electricity produced by Generator X by 2 MWh. Again, Generator X would have 'excess' permits that it could sell to another generator—allowing that generator to emit 2 more tonnes of greenhouse gases. If offset credits are also granted to the large energy user it will be able to sell these credits—allowing a further 2 tonnes of greenhouse gases to be emitted. Thus 4 tonnes of greenhouse gases will again be made available to the market from the one project.

This double counting issue can be addressed in a couple of different ways. One possible approach is to scale upwards the fossil fuel generators' liabilities to reflect the volume of offsets created by the renewable generator. Following our example in the box, Generator X could be required to surrender 102 credits for the 100 tonnes of greenhouse gases it produces. However, this would be difficult to administer and unsuitable under the cap and trade approach.

Another way around the double counting problem could be to reduce the number of permits available in the market by the number of offset credits created in the covered sectors: that is, to tighten the cap. In our example in the box, the government would need to reduce the number of permits available in the market to 98 (down from 100) to allow

for the fact that the additional two offset credits would become available. This runs into significant difficulties when the number of offset credits to be created in a certain year is unknown at the time that the permits are released (presumably at the start of the compliance year, through either allocation or auction).<sup>63</sup>

Alternatively, projects in these sectors could be credited with emissions permits, rather than offset credits. This would reduce the volume of permits that the government could auction each year but would provide for direct involvement by energy efficiency, renewable energy, and small-scale power generation in the NETS.

It should be noted, however, that, adjusting the number of available permits to be auctioned each year to reflect the number of these types of offsets being created during a particular year would create an additional amount of uncertainty in the market. It would also rely on a particular approach to auction design which included staging multiple permit auctions for each vintage of permit, including an auction after the end of each compliance year (but before the compliance date where liable parties must surrender permits). This issue, as well as other aspects of auction design, will be investigated after the release of this Discussion Paper.

The environmental integrity of the NETS is paramount to its success, and a key component of that is the projection of firm caps for the covered sector. It is proposed that price signals in the electricity market, rather than revenue generated via the creation of offset credits (or rewarding of emissions permits), be the key avenue through which the NETS drives investment in energy efficiency, small-scale (low-emission) power generation and renewable energy projects. Comments are sought on mechanisms, including those described above, that would allow these types of stationary energy sector abatement activities to receive credit, while not creating a problem with double counting.

There are a number of obstacles to the adoption of energy efficiency, small-scale (low-emission) power generation and renewable energy technologies **that lie outside the influence of price signals**. Addressing these obstacles requires targeted policies (outside the NETS) that address the specific barriers facing individual technologies. Some of these policies are outlined in Chapter 13 ‘Complementary measures’.

*It is proposed that renewable energy projects that displace grid-based generation and energy-efficiency projects in covered sectors not be eligible to create offset credits under the NETS.*

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<sup>63</sup> Adjustment of the number of permits released (either via allocation or auction) at the end of the compliance period is known as ‘ex-post adjustment’. This approach has been investigated by various Member States in the EU ETS, particularly Germany, to provide additional flexibility in the use of emissions intensity benchmarks in their permit allocation processes (‘National Allocation Plans’).

## 5.4 Priority areas for offsets

Although it is difficult at this stage to provide details of the precise rules governing individual projects or specific project sectors under the offsets regime, this section of the Discussion Paper provides an overview of the abatement activities that have been identified as priorities for initial inclusion in the NETS, and the general approach that is proposed for each type of activity.

The approaches specified below should be seen as preliminary, and they are subject to update based on further consultation processes, the release of international standards and methodologies (particularly those under JI), and further work by the Taskforce.

### 5.4.1 Forest projects

Forest projects represent a significant source of relatively low cost abatement within the Australian context. This has been demonstrated through a variety of initiatives to abate greenhouse gas emissions while at the same time realising the various co-benefits that forestry provides. These projects are an obvious starting point for offsets within an Australian NETS.

It is proposed that the rules governing forest projects under the NETS be based on the Carbon Sequestration framework currently operating under GGAS. The GGAS approach seeks to strike a balance between the need to ensure the environmental integrity of the system and the desire to encourage sequestration in a pragmatic and workable manner.

Key features of this framework include:

- Forests must be on land that is eligible under Article 3.3 of the Kyoto Protocol—that is, land that was cleared before 1 January 1990 and planted after (or on) that date. The land must also be able to have carbon sequestration rights registered over its title.
- The project proponent must be able to demonstrate that appropriate risk management procedures are in place regarding fire, disease, pests and climate variability.
- Before project registration, the project proponent must demonstrate to the satisfaction of the Scheme Regulator that it is capable of maintaining the sequestration for 100 years ('permanence').
- The abatement created through the forest (or pool of forests) is calculated by using the Australian Standard for Carbon Accounting, which provides for consistency with the Kyoto Protocol.
- Conservatism is built into the calculation of abatement through an additional requirement for project proponents to perform an analysis of the uncertainty in their regular estimates of carbon stocks accumulated. An adjustment is then made to their abatement claim to ensure that it is conservative.

- The legislation allows the Scheme Regulator to require the project proponent to furnish ‘financial assurances’ (such as a bond) or an insurance policy that could be drawn upon in the event that the sequestration is not maintained and the firm itself is unable to meet the make-good provisions. This provision has not yet been used in GGAS, but it is likely to be viable once appropriate insurance products are available on the market.

A major issue facing forest projects (as well as projects involving changes in agricultural land-management practices) is whether or not the project leads to ‘permanent’ or ‘temporary’ removal of carbon from the atmosphere (that is, whether it meets the concept of ‘permanence’). Forests, for example, can be harvested, burnt or subject to attack by pests and disease, reducing the amount of carbon that has been sequestered.

Under the GGAS framework, if sequestration is not maintained for 100 years,<sup>64</sup> then the project proponent is required to ‘make good’ the sequestration shortfall by surrendering GGAS abatement credits from other forest projects. This make-good requirement was built into GGAS at its outset to reduce the uncertainty around the use of forests for abatement.

It would be possible for the NETS to adopt a different definition of ‘permanence’. It would also be possible to adjust these ‘make-good’ provisions to allow the surrender of any permits or offset credits (not just from forest projects) if the sequestration were not maintained in accordance with the scheme’s rules. Comment is sought on appropriate treatment of permanency (including make-good provisions) for forest projects under the offsets regime.

*It is proposed that the rules governing the creation of offset credits from forest projects in Australia be based on the Carbon Sequestration framework currently operating under GGAS.*

*Comment is invited on how this approach should be adjusted or enhanced for the creation of offset credits from forest projects under NETS.*

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<sup>64</sup> One hundred years has been chosen as sufficient ‘permanency’, as this is the time frame used to calculate the Absolute Global Warming Potential of CO<sub>2</sub> (the method adopted by the Kyoto Protocol to account for total emission of greenhouse gases on a CO<sub>2</sub>-e basis). This is the approach adopted by the NSW and ACT GGAS scheme.

### 5.4.2 Carbon capture and storage

Capture of greenhouse gas emissions before they reach the atmosphere and their storage in geological formations (known as carbon capture and storage, or CCS) represents a potential way to achieve significant reductions in the level of emissions within the stationary energy sector. However, the successful development of CCS remains conditional on a number of factors, including:

- reducing the costs of applying the technology
- ensuring that the capture of carbon is safe, secure and permanent
- developing the necessary legal and regulatory frameworks (including property rights frameworks)
- gaining public acceptance of the technology.

It is proposed that, for the purposes of the NETS, carbon captured and stored in Australia via CCS technologies should be treated as a sequestration activity that can create offset credits, rather than a reduction in emissions *per se*. For example, in the case of a power generator connected to a CCS site, the carbon dioxide that is produced by the power plant would be counted as an emission by that generator. This would attract a liability, despite the fact that the carbon dioxide was not released to the atmosphere. When that carbon dioxide is sequestered in geological formations, offset credits are created by the party responsible for that sequestration. Presumably, commercial arrangements would be made between the party operating the sequestration process and the generator, such that the generator would receive the offset credits from the sequestration provider to surrender against its emissions liability. In some cases, the generator and the sequestration provider will be the same party, whereby their net position (with permit requirements, and offset credits created) will be close to zero emissions.

An alternative approach would be to treat the generator as having close to zero emissions in the first place. However, this would mean that the **generator** would need to be held responsible in the event that the sequestration was not maintained. Since liable parties under the NETS would not ordinarily have obligations spanning such long periods (perhaps 100 years) placed on them—which is much longer than the economic life of a power generation asset in any event—this approach would be problematic.

By separating out sequestration activities within the CCS process the overall integrity of the scheme could be better maintained. Conditions of project registration for the sequestration activity could be attached to the sequestration provider, which is likely to be more sensible than attaching them to the generator.

For example, if a geological sequestration site housed the emissions from several generators or other sources (that is, if it were a geological sequestration hub), and some carbon dioxide was later released, it would be purely arbitrary to pinpoint any particular generator as



having been at fault. It is unlikely that the entity responsible for generating electricity at the power station would be the same entity responsible for transporting the CO<sub>2</sub> through a pipeline and effectively storing the gas for the required amount of time. By separating the ownership of the emissions and the geological sequestration it would be more likely that the risk associated with each of the activities would be better understood and managed.

*It is proposed that, for the purposes of the NETS, carbon sequestration via CCS activities in Australia should be treated as a geological sequestration activity that can create offset credits, rather than as a reduction in emissions per se.*

The development of rules governing the creation of offsets from CCS technologies would need to occur within the context of broader CCS legislation likely to be enacted in the future. Guiding principles for such legislation were published by the Ministerial Council on Mineral and Petroleum Resources in 2005. International efforts to better define this abatement activity are moving quickly, with a number of trials either under way or planned in various parts of the globe. There are also processes underway within the EU ETS to examine policy choices and within the CDM to examine methodologies for this type of project.<sup>65</sup>

For the purpose of the NETS, it is proposed that equivalence and permanence rules for CCS technologies should at least reflect those established for forest projects. That is, a project proponent must be able to demonstrate that it is able to sequester the carbon for the period deemed to represent permanence, and that the necessary risk management procedures are in place to prevent incidents that may lead to carbon being released back into the atmosphere. Obviously, this would not relieve a proponent from any broader legislative responsibilities that may be enacted regarding the permanence of carbon sequestration through CCS and the liability for leakages.

*It is proposed that, for the purpose of the NETS, permanence rules for sequestration via CCS technologies should be consistent with those established for the permanency of sequestration in forest projects, and follow broader legislative requirements regarding site selection, monitoring, permanence and liability.*

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<sup>65</sup> At the time of writing, at least one new baseline and monitoring methodology has been submitted to the CDM Executive Board for consideration.

### 5.4.3 Industrial processes

Emissions from the Australian industrial processes sector were 29.8 Mt CO<sub>2</sub>-e in 2004—approximately 5% of total national emissions. Metal production accounted for 49% of these emissions, driven largely by emissions from iron and steel production (10.1 Mt CO<sub>2</sub>-e) and aluminium smelting (4.5 Mt CO<sub>2</sub>-e). Mineral products accounted for a further 18% of emissions (5.5 Mt CO<sub>2</sub>-e), largely from cement clinkers (3.5 Mt CO<sub>2</sub>-e) and lime production (1.1 Mt CO<sub>2</sub>-e). Other sources of industrial process emissions include the production and consumption of halocarbons and chemical production processes.

It is possible that industrial process emissions could at some point in the future be covered under the NETS (see Chapter 2). However, **as a transitional measure**, it is proposed that existing facilities in Australia be eligible to create offset credits whereby they are able to reduce their emissions below the expected ‘business as usual’ levels during that transitional period. These levels could be determined on an emissions per unit of output basis, with the baseline being determined using an average emission per unit of output over a defined baseline period.

For new installations or major capacity upgrades, it is proposed that the baseline emissions be determined by comparison to what the Scheme Regulator deems to be Australian national best practice at the time of project implementation, as a proxy for business as usual levels.

*As a transitional measure, it is proposed that facilities producing industrial process emissions in Australia be eligible to create offset credits whereby they are able to reduce their emissions intensities below the expected ‘business as usual’ levels.*

### 5.4.4 Methane emissions from the waste sector

Emissions from the Australian waste sector accounted for some 19.1 Mt of CO<sub>2</sub>-e in 2004 or approximately 3% of total national emissions. The majority of emissions (some 15.0 Mt CO<sub>2</sub>-e) resulted from the release of methane during the decomposition of organic material in landfills. A further 3.9 Mt CO<sub>2</sub>-e occurred as methane emissions from the decomposition of organic matter in sewage treatment facilities during the treatment and disposal of waste water.

The collection and use of methane from the waste sector is increasing in Australia. Landfill gas, sewage gas, and methane from other waste streams (e.g. biodigesters) have much higher GWPs than the carbon dioxide that results from combustion of the methane. This means that simply capturing methane (which would have otherwise been directly emitted to the

atmosphere) and putting it through a combustion process creates significant abatement. Many power generators that use waste methane in landfill gas or sewage gas are currently participating in GGAS and creating substantial numbers of abatement certificates from their methane combustion activities.

It is proposed that offsets projects in Australia involving the collection and combustion of landfill gas, sewage gas or methane from other waste streams<sup>66</sup> be able to create offset credits for abatement over and above any prevailing regulatory requirements.

*It is proposed that projects in Australia relating to the collection and combustion of methane from landfills and from wastewater and other treatment facilities be eligible for the creation of offset credits under the NETS.*

## 5.5 Extension of eligible offsets

The priority areas outlined above are those that are proposed for inclusion upon commencement of the scheme, which could be as early as 2010. However, considerable work is currently being undertaken by a variety of organisations to develop robust methodologies and accounting protocols for activities beyond those discussed above. It is also worth noting that the introduction of a market signal is likely to drive the development of new and innovative low-emissions technologies and abatement activities, many of which may either not have been conceived yet or are currently in the very early stages of development.

With these factors in mind, it is proposed that administrative processes be developed to allow project proponents with abatement initiatives in other sectors (outside of the priority areas for offsets described in Section 5.4 above) to submit project methodologies for consideration by the Scheme Developer and the Ministerial Council (see Chapter 8 for further detail on proposed institutional arrangements). These methodologies would be reviewed taking into account factors such as consistency with international approaches (in particular those approved by the JISC), data credibility, and likely measurement accuracy. Projects for which the methodology is approved would be eligible to create offset credits (providing they meet all other requirements of the offsets regime).

One example of an activity that may fall into this category is the strategic management of savanna fires, which account for some 48% of emissions in the Northern Territory. In recent years the Northern Territory Government, in conjunction with the CRC for

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<sup>66</sup> Biodigesters and other processes that convert waste that would normally be put into landfill (or fallow) can also produce useful methane.

Tropical Savannas and the CSIRO, has been investigating methodologies for calculating and monitoring these emissions. While not fully developed at present, these methodologies could be submitted to the Scheme Developer and the Ministerial Council for consideration in the future (see Chapter 8).

Another important area for expansion is the group of carbon sinks that fall under Article 3.4 of the Kyoto Protocol.<sup>67</sup> This includes a broad category of potential abatement activities, including revegetation; rangelands grazing and cropping system management; improved agricultural practices; and forest management practices. Although the framework developed for offsets from forest projects could be readily adapted to these activities, reliable quantification of this type of abatement is still a significant hurdle. It is anticipated that, over the coming 2 to 5 years, robust approaches to quantifying abatement in these areas will be developed and endorsed and eventually submitted to the Scheme Developer and Ministerial Council for inclusion in the NETS offsets regime.

Avoided deforestation has already made a significant contribution to reducing greenhouse gas emissions in Australia. For example, a phase-out of broadscale land clearing in Queensland has done more than any other action to help Australia achieve its 2012 target under the Kyoto Protocol. Internationally, a number of groups are examining whether a robust methodology can be developed that would appropriately reward avoided land clearing. These developments need to be monitored to see whether avoided land clearing could be included as an offset in any Australian emissions trading scheme.

Further examples of potential areas for expansion of the offsets regime include:

- emission reductions arising from fuel switching by generators that are too small to be covered under the emissions cap
- avoided methane emissions from reduced landfill
- transport-related emissions reductions.

Chapter 2 suggests that the coverage of industries under the cap will be expanded through time. The creation of offsets in some sectors should therefore be seen as a transitional measure that provides incentives for abatement before the possible inclusion of the sector under the cap. In such cases, it is proposed that potential project proponents be notified well in advance of when they will be covered by the cap, in line with the process described in Chapter 2.

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<sup>67</sup> By the end of 2006, the Commonwealth Government must elect to include or not include Article 3.4 sinks in Australia's national greenhouse gas inventory for the years 2008–12. This decision will need to be considered in the development of detailed rules and methodologies for abatement projects in this sector.

## 5.6 Offset credits from other schemes

Clearly, any offset credits that have already been used to meet obligations under other schemes could not be used again to meet obligations under the proposed NETS; that is, offset credits could not be ‘reused’. This, however, is not the case for offset credits that have been created under other schemes, but not surrendered or ‘used’.

The benefits and pitfalls associated with linking emissions trading schemes are examined in Chapter 12. It is clear from this analysis that while bilateral linking may reduce the cost of achieving the aggregate cap of two linked schemes, unrestricted trading with other schemes (such as the EU ETS) may increase the cost of achieving a domestic emissions target in Australia.

There are, however, strong arguments for recognising offset credits created under the Kyoto mechanisms—specifically, the recognition of CDM credits (known as CERs<sup>68</sup>) as legitimate offsets within the NETS.<sup>69</sup> Allowing liable parties under the NETS to meet compliance by ‘surrendering’ CERs would provide a variety of benefits but some potential pitfalls.

From a practical perspective, such recognition of CERs would provide an important connection between a domestic scheme in Australia and the quickly maturing international carbon market, without specifically requiring the formal linking of schemes across national borders or the direct involvement of the Commonwealth Government.<sup>70</sup>

It would allow Australian companies to gain valuable experience in sourcing project-based abatement on the international market, promoting direct participation in international abatement projects where possible. Direct exposure to these mechanisms should help to prepare Australian businesses for future climate change regimes where project-based mechanisms such as the CDM are likely to underpin international agreements, primarily because of their value in realising technology transfer and sustainable development objectives.

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<sup>68</sup> CDM projects involving afforestation and reforestation can produce only tCERs or ICERs, which are temporary credits under the CDM framework and must be replaced after a period of time with ‘permanent’ CERs. It is not proposed that tCERs or ICERs be accepted as equivalent to ‘permanent’ CERs from other types of CDM projects.

<sup>69</sup> This ‘linking’ could be accomplished quite simply within the current rules of transactions under the Kyoto Protocol. The Scheme Regulator would establish an account in the national registry of, say, Ireland or the UK. CERs to be used in the Australian scheme would be transferred to the Scheme Regulator’s account so that they could be ‘surrendered’ into the cancellation account of that registry. Corresponding credits would then be created in appropriate accounts in the Australian registry, essentially transferring the ‘recognition’ of the offset credits from one scheme to another.

<sup>70</sup> Commonwealth leadership of the NETS is the preferred model of the State and Territory Governments. A State- and Territory- based emissions trading scheme is being developed in the absence of this leadership.

Furthermore, recognition of CERs provides an additional ‘safety valve’ for the price of offset credits under the NETS (that is, if the costs of domestic abatement exceed those to be found internationally). For instance, if the price of Australian domestic offset credits or permits were less than the price of CERs, liable entities would not be likely to surrender CERs to create domestic offsets credits. Alternatively, if the price of Australian domestic offset credits or permits were to reach the international price for CERs, liable entities in the NETS would be likely to buy and surrender CERs. Thus the price paid by liable parties in Australia would be unlikely to exceed the price of CERs on the international market. It should be noted that the economic modelling undertaken by the Taskforce to date has not taken into account the availability of CERs and hence the impact that recognition of CERs might have on the affordability of different scheme caps.

The size of the Australian market for offset credits would be very small compared with the total expected size of the CER market. Current indications are that at least 1.25 billion CERs will be generated by the end of 2012, and that the price will be in the range of €10 to €15 per CER, or approximately AUS\$17 to \$25.<sup>71</sup> However, there is no guarantee that the CDM as a mechanism will exist indefinitely. This creates some uncertainty that, in the very long term, the availability of CERs may be limited.

There is also a chance that if the costs of permits and offset credits in initial years of the NETS were consistently high compared with CER prices, then a large number of CERs would be expected to ‘enter’ the Australian system. From an environmental perspective, this would not affect the net emissions under the NETS cap, but would imply that not as much abatement was occurring in Australia.

This could result in fewer low-emissions investments occurring in Australia, and potentially delay the structural adjustments that are necessary to significantly reduce Australia’s greenhouse gas emissions.

Comment is sought on whether some form of limit should be placed on the volume of CERs that would be recognised as offset credits under the NETS. This limit could take the form of quantitative limits, such as a percentage of total emissions for any particular year, or the form of an additional eligibility test, such as requiring an Australian business to be involved in the CDM project.

Comment is also sought on whether setting limits on the volume of CERs that should be recognised under the NETS would reduce the value of this feature as a ‘safety valve’ for the price of offset credits.

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<sup>71</sup> Erik Haites, Margaree Consulting, consultancy prepared for the Taskforce.

*It is proposed that credits from CDM projects (known as CERs) be recognised as equivalent to offset credits under the NETS.*

*Comment is sought on whether limits should be placed on the volume of CERs recognised as equivalent to offset credits, and on the implications of such limits.*

## **5.7 Conclusion**

The inclusion of offsets in the NETS would broaden the scope of the scheme to provide an incentive to undertake projects that would not otherwise have been influenced by the price of greenhouse gas emissions. In doing so, the use of offsets would help to increase the liquidity of the market and lower the overall cost of meeting the cap.

Any offsets regime introduced under the NETS would need to ensure that the environmental integrity of the scheme itself was maintained. This means ensuring that offsets meet strong additionality, permanence and measurement criteria and that baseline and monitoring methodologies are robust.

It is proposed that, as a general principle, the rules governing the creation of offsets under the NETS should be consistent with emerging approaches being developed for the JI mechanism under the Kyoto Protocol. Consistency with these approaches would not only help ensure the credibility of offsets but would also capitalise on international experience and learning.

Although priority areas for offsets have been identified, it is proposed that a flexible approach be adopted to allow project proponents to submit methodologies for projects in other areas. These would then be reviewed by the Scheme Developer against set criteria designed to protect the integrity of the scheme. Projects for which methodologies are approved would be eligible to create offset credits.

It is proposed that credits created under the CDM of the Kyoto Protocol (excluding temporary credits) be recognised as equivalent to offset credits under the NETS. This would provide an important connection between the Australian and international carbon markets and would act as an additional safety valve for the price of domestic abatement.

## **6 Estimated impacts of addressing greenhouse gas emissions through the NETS**

*This Chapter sets out preliminary estimates of the impacts of the indicative scheme caps, which were identified in Chapter 3, on the electricity sector and the broader Australian economy. It shows that the economy is estimated to continue to grow strongly with a carefully designed emissions trading scheme and, in particular, that the potential impacts on those sections of the economy that are likely to most adversely affected can be managed effectively.*

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### **6.1 Background**

An emissions trading scheme is one way of requiring emitting industries to bring to account the costs of greenhouse gas emissions, in order for those costs to become part of the decision making processes of emitters. For example, attaching a cost to emissions in the electricity market would have an effect on generators' operating costs. The more emissions-intensive the generator, the greater the increase in its costs.

These changes to generators' operating costs have broader implications. Patterns of output and investment across different categories of generators are likely to change in favour of lower emissions plant. Electricity prices are also likely to be affected.

In turn, these changes in the electricity market are likely to result in further impacts throughout the economy. Similarly, applying an emissions price to other areas of the economy would also affect costs and prices in those sectors, and potentially patterns of use.

The NETT commissioned economic modelling to examine the potential implications of the *indicative* scheme caps identified in Chapter 3 on the electricity sector and the broader Australian economy. This Chapter sets out the modelling methodologies, assumptions and results of that work.<sup>72</sup>

The modelling work undertaken to date is informative, providing a sound indication of the likely order of magnitude impacts. However, this work is only a first step towards understanding the impacts of key design choices such as the scheme cap and coverage. Further modelling is needed to inform decisions on a scheme design that best maintains Australia's economic prosperity and growth, informed by stakeholder feedback.

Comments are therefore sought on all aspects of the modelling. This feedback will be an important input to further modelling that will be undertaken in the next phase of scheme design.

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<sup>72</sup> Copies of the consultants' modelling reports can be found at [www.emissionstrading.net.au](http://www.emissionstrading.net.au).



## **6.2 The modelling approach**

To estimate the likely impacts of the proposed scheme, two types of modelling have been undertaken:

- **Electricity market modelling:** To give details of the likely impacts on patterns of investment and operating decisions in the electricity market, including emissions permit prices, energy prices (wholesale and retail), emissions from electricity generators, and the impacts on particular types of generators. This ‘bottom-up’ modelling was undertaken by McLennan Magasanik Associates (MMA).
- **Economy-wide modelling:** To assess the impacts on the economy more broadly, including the effects on particular industries, regions and patterns of consumption and growth. The economy-wide modelling was undertaken by the Centre of Policy Studies (CoPS) using its detailed computable general equilibrium (CGE) model of the Australian economy (MMRF-GREEN), which has a major element relating to greenhouse gas emissions.

Insight Economics and The Allen Consulting Group coordinated the modelling exercise undertaken by MMA and CoPS.

The first stage of the modelling was to develop input assumptions. MMA used its extensive database on supply costs for electricity generation and stationary energy activities, and of future costs of new technologies for electricity generation and energy efficiency programs.

The second stage involved detailed modelling of the electricity markets over the timeframe of the study (2010–30) using MMA bottom-up models of the National Electricity Market (NEM), South West Interconnected System (SWIS) in Western Australia and the Darwin-Katherine Integrated System (DKIS) in the Northern Territory. MMA also modelled the Australian wholesale gas market.

Outputs from the bottom-up models were then incorporated by CoPS into the MMRF-Green model to determine the economy-wide impacts of the proposed emissions trading scheme, including growth, consumption, employment, greenhouse gas abatement, energy demand, investment and inter-industry effects.

A full description of the MMA and MMRF-GREEN models is provided in the consultants’ reports (available at [www.emissionstrading.net.au](http://www.emissionstrading.net.au)).

### **6.2.1 Modelling assumptions**

Assumptions can have a significant impact on the results and are therefore critical to any modelling exercise. The Taskforce worked closely with the consultants in developing the assumptions underpinning the modelling of a NETS.

Comments are sought from stakeholders on the electricity market and economy wide assumptions adopted for this first stage of modelling of a NETS (described below). This feedback will be an important input to future modelling exercises that are needed to inform scheme decisions.

For the electricity market modelling, the impacts of the *indicative* scheme caps are compared against MMA's business as usual (BAU) base case over the study period 2010–30. The detailed assumptions used in the electricity modelling are presented in MMA (2006), *Impacts of a National Emissions Trading Scheme on Australia's Electricity Markets*. Key MMA assumptions include:

- Overall electricity demand forecasts were taken from the MMRF Base Case for the first stage of MMA modelling (see above). MMA split these forecasts by region and 'shaped' them to represent periods of peak and off-peak demand according to patterns forecast by relevant system operators.
- Existing generation capacities and costs were taken from the MMA database, which draws on a variety of sources.
- The costs, capacities and availabilities of new generation options were also developed by MMA, from a wide variety of sources.
- No expansions of the capacity of the transmission networks were assumed, besides announced capacity upgrades.
- Generators were assumed to bid in a way estimated to maximise their profits in an imperfectly competitive market until such time as new capacity was added in their respective electricity markets. At that time, generators were assumed to bid at marginal cost.
- The essential features of the Australian wholesale gas market were replicated using a model developed by MMA including estimates of gas resources and infrastructure, gas and supply demand, production and haulage costs and gas supply agreements.

For the economy-wide modelling, the impacts of the *indicative* scenarios were compared against the MMRF-Green base case scenario (hereafter 'the base case') over the study period 2010–30. The detailed assumptions used in the economy-wide modelling are presented in The Allen Consulting Group (2006), *The Economic Impacts of a National Emissions Trading Scheme*.

Key MMRF-Green base case assumptions include:

- State and Territory macroeconomic forecasts from Access Economics to 2014 were used, supplemented by the information from the Commonwealth Government's Intergenerational Report.<sup>73</sup>
- National-level assumptions for changes in industry production technologies and in household preferences were sourced from CoPS.
- Forecasts through to 2010 for the quantities of agricultural and mineral exports were sourced from ABARE, and estimates of capital expenditure on major minerals and energy projects from various sources, such as state government agencies, ABARE and NEMMCO have been used.
- The actions of parties that have ratified the Kyoto Protocol were incorporated, but no further global action on climate change post 2012 has been assumed.
- The international price of oil was based on the IEA 2005 World Energy Outlook Reference Scenario.<sup>74</sup> That Scenario projects that world oil prices will fall back from recent levels – at around US\$65 (2004 prices) in September 2005 – to around US (2004) \$35 in 2010, before rising steadily to reach around US (2004) \$39 by 2030.

Assumptions that are common to the electricity market and economy-wide modelling include:

- Arrangements and policies as at 1 January 2006 remain in place except for the New South Wales and ACT Greenhouse Gas Abatement Scheme, which was assumed to cease at the end of 2012.<sup>75</sup> The Commonwealth Mandatory Renewable Energy Target and the Queensland 13% Gas Scheme have been explicitly modelled.
- Specific design features of the NETS that are set out in the box below.

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<sup>73</sup> See <http://www.budget.gov.au/2002-03/bp/html/index.html>

<sup>74</sup> See <http://www.iea.org>

<sup>75</sup> The NSW Government has announced that in the event that a national emissions trading scheme is not introduced, it will extend GGAS to 2020. The scheme will continue on a rolling 15 year basis thereafter if an agreement on a NETS is delayed. Given uncertainties in the final policy design, as well as a desire to compare the NETS against a 'without emissions trading' backdrop, the BAU scenario has been constructed with the scheme finishing in 2012.

**Modelling assumptions on the specific design features of the NETS**

- The emissions trading scheme commences in 2010.
- The indicative scheme cap applies to electricity-generation combustion-only emissions from 2010. The non-electricity Stationary Energy Sector (that is, direct combustion of coal, oil and gas) was included in the scheme from 2015. That expansion of coverage was reflected in the MMRF-Green modelling by applying the same permit price calculated by MMA for the electricity generation sector to the direct combustion of coal, oil and gas from 2015. In this way, a quantity target was not directly modelled for direct combustion emissions, although the effects of a similar price applying in those sectors as for electricity were explored.
- Free permits were allocated to existing generators at the commencement of the scheme, sufficient to offset any net loss in profits as a result of the emissions trading scheme for the period 2010–30. All other existing generators and new generators are assumed to buy permits from the market. The size of such compensation was estimated in the MMA modelling.
- Energy-intensive trade-exposed industries were compensated for 100% of increased energy costs for the period 2010–30. Compensation, in the form of free permits (modelled as a production subsidy), was applied to those sectors which have non-transport energy costs with more than 3.5% share of total operating expenses in 2003–04. Compensation amounts were calculated in the MMRF-Green modelling. It is noted that the NETT has not proposed a threshold for a business to be defined as energy-intensive, trade-exposed.
- Remaining permits—beyond those used to compensate existing generators and trade-exposed energy-intensive industry—were assumed to be auctioned, with surplus revenue recycled in the MMRF-Green modelling as a lump sum to households (apportioned to each State and Territory in proportion to population).
- Unrestricted banking and no borrowing were assumed. The impact of banking was reflected in MMA modelling of the permit price, which was an input to the MMRF-Green modelling.
- Modest amounts of energy efficiency were assumed to be available in all scenarios. Under the sensitivity simulation, additional investments in energy efficiency were assumed to be available in both the MMA and MMRF-Green modelling. That is, the level of end use energy demand was reduced by approximately 6% by 2020 and by 13% by 2030.
- Under the sensitivity simulation, an additional 0.1% of technical change (in end use energy productivity or tastes) was applied in the MMRF-Green model, in proportion to every \$10/t change in the carbon price. The additional technical change was introduced with a five year lag and lasted for 10 years, before returning to historic rates of change (which are 0.4 and 0.8% improvements in annual intermediate input-using technical productivity and 0.4 to 0.5% shifts in household tastes away from energy).
- The amount of bio-sequestration created by the forestry sector in response to the permit price was estimated using a model developed by MMA. Modest amounts of biosequestration approaching 3.5 Mt p.a. and 5.9 Mt p.a. were assumed in Scenarios 1 and 2 respectively. Biosequestration offsets rising to 14 Mt p.a. at 2030 were assumed to be available under the sensitivity simulation.
- Two *indicative* scheme caps were assumed to apply to the electricity generation emissions during the period 2010–30 (see 6.2.2). Additionally there was a sensitivity scenario using the higher indicative cap.

### **6.2.2 Indicative caps modelled**

Chapter 3 identified two *indicative* cap scenarios and one ‘sensitivity’ assessment of the impact of introducing complementary measures such as additional offsets, enhanced energy conservation and induced technological change for modelling purposes.

Given data limitations on future emissions projections and the scope to reduce emissions, the modelling work has been carried out using *indicative* caps on emissions for the electricity generation sector only. The level of the increase in the scheme cap to accommodate the proposed inclusion of emissions from stationary combustion of gas, oil, coal and other fossil fuels emissions, along with fugitive emissions from gas transmission and distribution in 2010 or 2015, has not been determined at this stage because a greater level of certainty in their emissions data is required.<sup>76</sup> Nevertheless, the permit price that results from the *indicative* electricity generation cap scenarios has been applied to the direct combustion of gas, oil and coal from 2015 in the economy-wide modelling so as to give a preliminary estimate of the impacts of expanding scheme coverage.

The *indicative* scenarios modelled include:

- **Scenario 1:** Under this scenario, electricity generation emissions are capped at 176 Mt in 2030, which is approximately the level of electricity generation emissions in 2000. It represents a 33%, or 88 Mt, reduction on forecast business as usual emissions for this sector in 2030.
- **Scenario 1a:** This scenario is a sensitivity on Scenario 1 that assumes the same cap (176 Mt), but with higher levels of energy efficiency, biosequestration offsets and induced (demand side) technological change. The main purpose of this scenario is to illustrate the extent to which the costs of reducing emissions could be mitigated with complementary measures. It is noted that additional policy measures would be required to deliver the amounts of energy efficiency assumed in this sensitivity scenario.
- **Scenario 2:** Under this scenario, electricity generation emissions are capped at 150 Mt in 2030, which is approximately the level of electricity generation emissions in 1997. It represents a 43%, or 114 Mt, reduction on forecast business as usual emissions for this sector in 2030.

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<sup>76</sup> As discussed in Chapter 9, the Commonwealth and all State and Territory Governments are currently working on ways of streamlining emissions monitoring and reporting, to develop a nationally consistent approach. State and Territory Governments have proposed that emissions reporting be mandatory (above certain thresholds) by no later than 1 January 2008. It is envisaged that this process could generate valuable starting-point information to assist in adjusting the scheme cap to accommodate the expansion of coverage beyond the electricity generation sector.

## **6.3 Results of electricity market modelling**

This section analyses the preliminary results and key findings of the electricity market modelling including the effects of the *indicative* scenarios on abatement, emissions permit prices, wholesale and retail electricity prices, and generator capacity mix and production.

### **6.3.1 Permit prices**

Permit prices generally reflect the stringency of the scheme cap and the cost and availability of abatement opportunities over the period of the scheme. Other factors, such as the amount of energy efficiency uptake, the rate of technical change and the availability of offsets, can also have a significant influence on permit prices.

The lower (stricter) emissions cap for the electricity generation sector in Scenario 2 leads to higher real permit prices than Scenario 1 (Figure 6-1).

Scenarios 1 and 2 have similar permit prices in the beginning of the period (starting at \$12/t CO<sub>2</sub>-e in 2010 and rising to around \$20/t CO<sub>2</sub>-e by 2015) because they share similar emissions caps over this period. Although the emissions caps are in line with business as usual projections during these earlier years, the permit price is not zero because banking is occurring (see below). That is, (cheaper) abatement is undertaken early in the period, which reduces the need for (more expensive) abatement towards 2030 when the caps are more stringent.

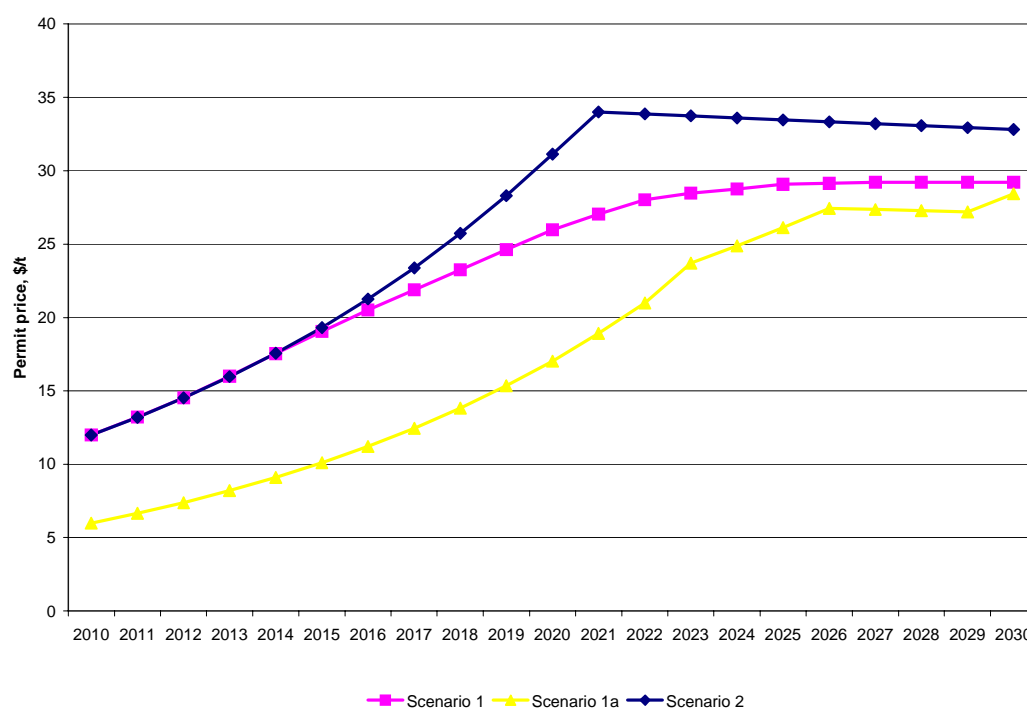
Permit prices in Scenario 1 rise to just under \$30/t CO<sub>2</sub>-e in 2024, whilst permit prices in Scenario 2, which has the more stringent cap, peak at \$34/t CO<sub>2</sub>-e in 2022. In both scenarios the permit prices remain at the peak levels until 2030. These higher permit prices reflect the greater abatement task post-2020 compared with pre-2020, and the cost of abatement opportunities during this period.

Scenarios 1 and 1a aim to achieve the same emissions cap in 2030. However, increased uptake of energy efficiency uptake and biosequestration offsets is assumed in Scenario 1a which leads to lower permit prices than Scenario 1, particularly in the early years of the scheme. Scenario 1a permit prices begin at \$6/t CO<sub>2</sub>-e, half the level under Scenario 1, and gradually increase over the period to reach levels similar to Scenario 1 from around 2026.

Unlimited banking is assumed in all scenarios. Banking is important because it allows liable parties to undertake relatively cheap abatement opportunities in the early years (banking permits in excess of the annual caps), surrendering those banked permits to meet caps in later years and thereby avoiding higher abatement costs in those years. This generally has the effect of increasing permit prices in the early years, but lowering prices in the later years, compared with a scheme design where banking is restricted or not allowed.

The net present value of all permits issued for the period 2010–30 is around \$49 billion in Scenario 1 and \$53 billion in Scenario 2, using a 6% discount rate. This translates into an average cost per tonne emitted of \$22/t CO<sub>2</sub>-e and \$24/t CO<sub>2</sub>-e, respectively. With additional complementary policy measures (Scenario 1a) the net present value of the total permits in the period 2010–30 would be reduced from \$49 billion to \$35 billion, and the average cost per tonne emitted would be reduced from \$22/t CO<sub>2</sub>-e to \$15/t CO<sub>2</sub>-e.

**Figure 6-1: Estimated real permit prices**



Source: MMA (2006), *Impacts of a National Emissions Trading Scheme on Australia's Electricity Markets*.

### 6.3.2 Abatement pathway

Permit prices drive the level of abatement compared with business as usual greenhouse gas emissions.

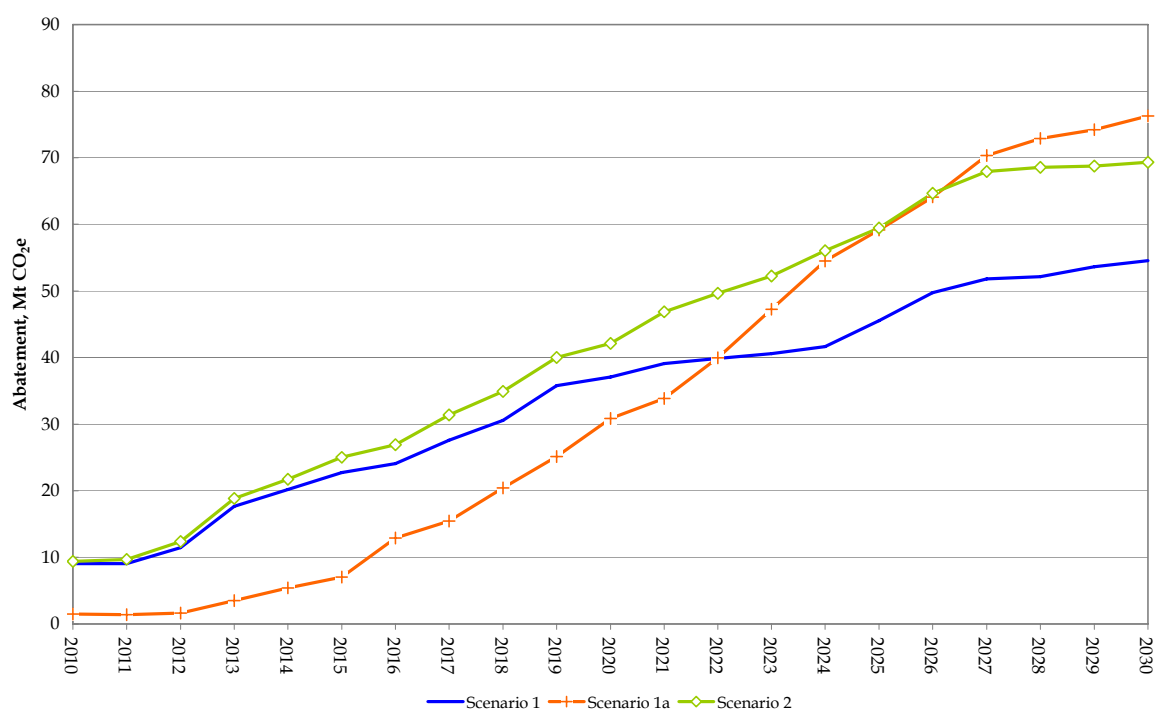
Figure 6-2 shows the total annual abatement pathway for electricity generation (including biosequestration offsets) expected under each scenario. Abatement is low in the early years of the scheme under Scenarios 1 and 2 and largely occurs as a result of fuel switching to low emission intensity gas plant. Abatement increases significantly post 2020, reflecting tighter emissions caps and higher permit prices. Abatement reaches around 55 Mt per annum and 70 Mt per annum by 2030 in Scenarios 1 and 2, respectively.

The key sources of abatement after 2020 include:

- a marked increase in the level of renewable generation
- conversion of integrated gasification combined cycle (IGCC) coal plant to include pre-combustion carbon capture and storage
- change in the dispatch of existing plant
- limited retirement of some old coal fired plant in the NEM.

The abatement pathway in Scenario 1a reflects additional opportunities for increased uptake of energy efficiency and biosequestration offsets. Abatement is lower in Scenario 1a in the early years compared with Scenario 1, but rises steadily over the period and exceeds the annual level of abatement in Scenario 1 from 2023. This is because energy efficiency and biosequestration opportunities are assumed to increase significantly post 2020 (the level of energy efficiency is assumed to grow from 6% in 2020 to 13% in 2030, and the amount of biosequestration offsets is assumed to grow from 4 Mt per annum in 2020 to 14 Mt per annum in 2030).

**Figure 6-2: Abatement pathway**



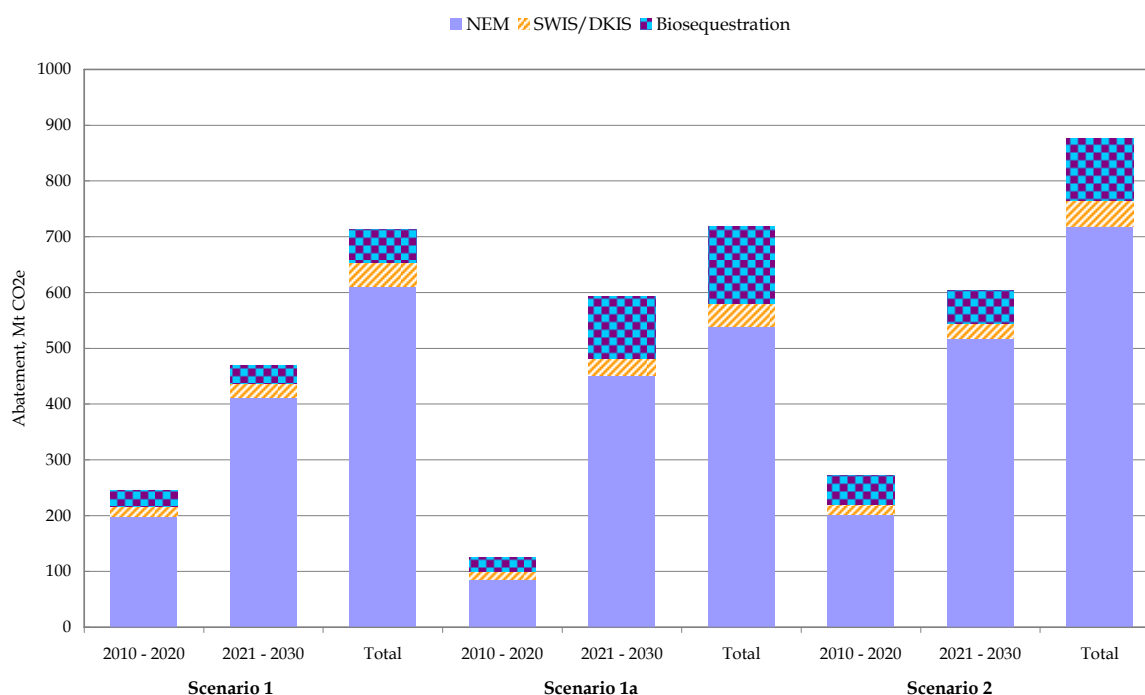
Source: MMA (2006), *Impacts of a National Emissions Trading Scheme on Australia's Electricity Markets*.



Scenario 2 delivers the highest level of cumulative abatement (including biosequestration offsets) over the period 2010–30, at 876 Mt (Figure 6-3). Scenario 1 has a less stringent cap compared with Scenario 2 and is expected to deliver cumulative abatement of 714 Mt over the same period. Scenario 1a has the same overall cap in emissions as Scenario 1 and therefore is expected to result in near identical cumulative abatement as that scenario.

Biosequestration offsets are estimated to contribute 137 Mt of cumulative abatement over the period 2010–30 with complementary policy measures (Scenario 1a), compared with 61 Mt of abatement in Scenario 1. However, these results should be interpreted with care because the estimates depend on assumptions on uptake rates, which are highly uncertain.

**Figure 6-3: Abatement by source**



Source: MMA modelling

### 6.3.3 Electricity prices

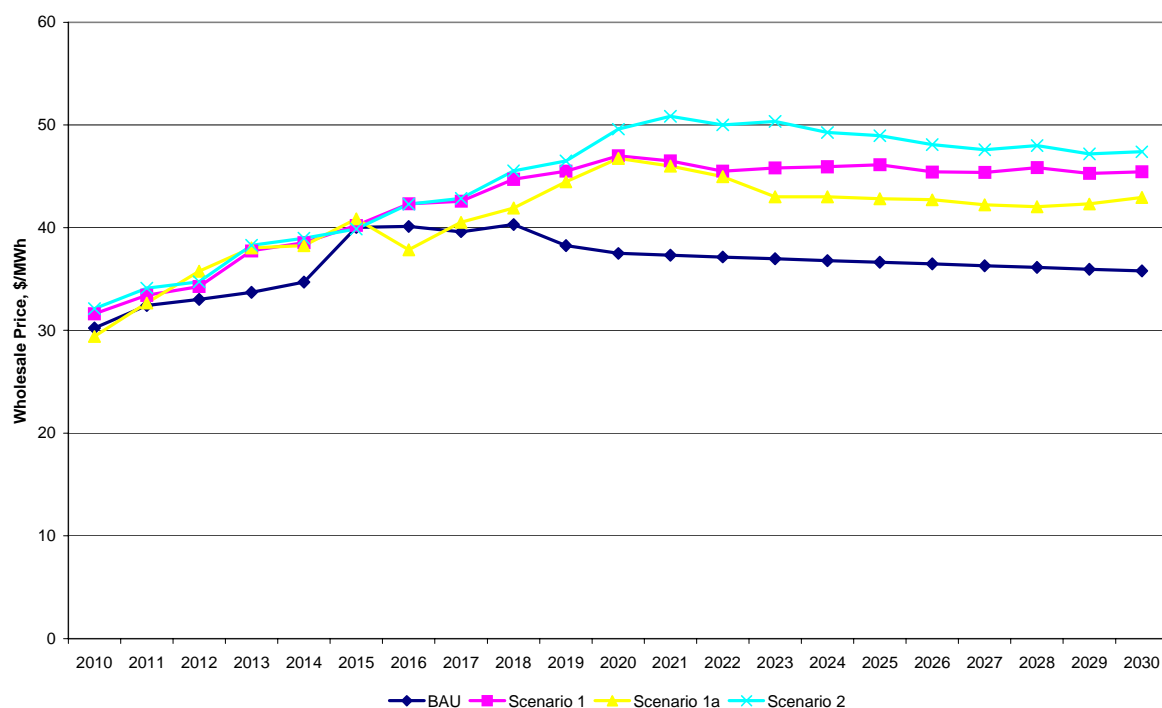
An emissions trading scheme is expected to have an impact on wholesale electricity prices. Fossil fuel generators would need to purchase permits to emit greenhouse gases when they generate electricity, which would add to their short run marginal costs and directly increase wholesale electricity prices. This makes lower emissions generation (which is typically more expensive) more competitive.

In the NEM, wholesale prices average around \$36/MWh over the period 2010–30 under business as usual (Figure 6-4). Average wholesale prices rise to around \$43/MWh and \$44/MWh in Scenarios 1 and 2, respectively. The results vary by region within the NEM.

With greater energy efficiency and additional biosequestration offsets in Scenario 1a, the average wholesale price increase would be expected to be reduced, resulting in average prices of around \$41/MWh.

Over the period 2010–30, wholesale prices across the NEM in each year are expected to be on average 17% and 22% higher than business as usual prices in each year for Scenarios 1 and 2, respectively. The level of the wholesale price increases are small initially, and rise over time, reflecting the path of permit prices.

**Figure 6-4: Estimated wholesale prices—National Electricity Market**

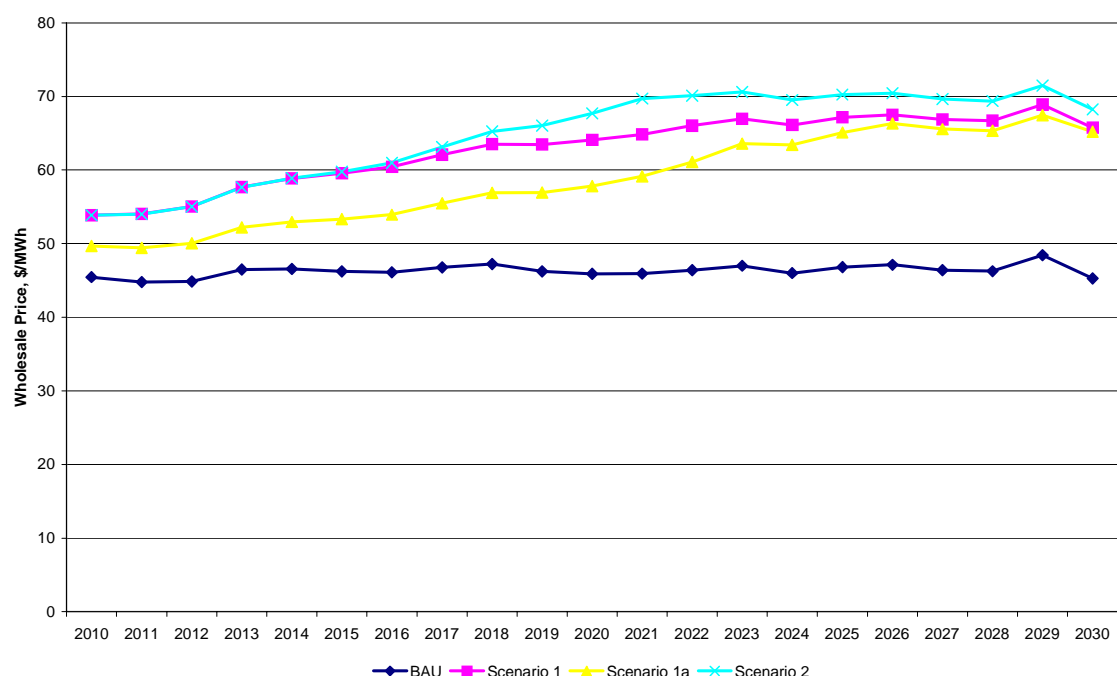


Source: MMA (2006), *Impacts of a National Emissions Trading Scheme on Australia's Electricity Markets*.

In the SWIS and the DKIS, wholesale prices average around \$46/MWh and \$62/MWh, respectively, under business as usual over the period 2010–30 (Figure 6-5 and Figure 6-6).

In the SWIS, over the period 2010-30 the wholesale prices in each year are expected to be on average 36% and 40% higher than business as usual prices in each year in Scenarios 1 and 2, respectively. With greater energy efficiency and additional biosequestration offsets in Scenario 1a, the wholesale price increases compared to business as usual would be expected to be smaller, down from an average of 36% in Scenario 1 to an average of 27% in Scenario 1a.

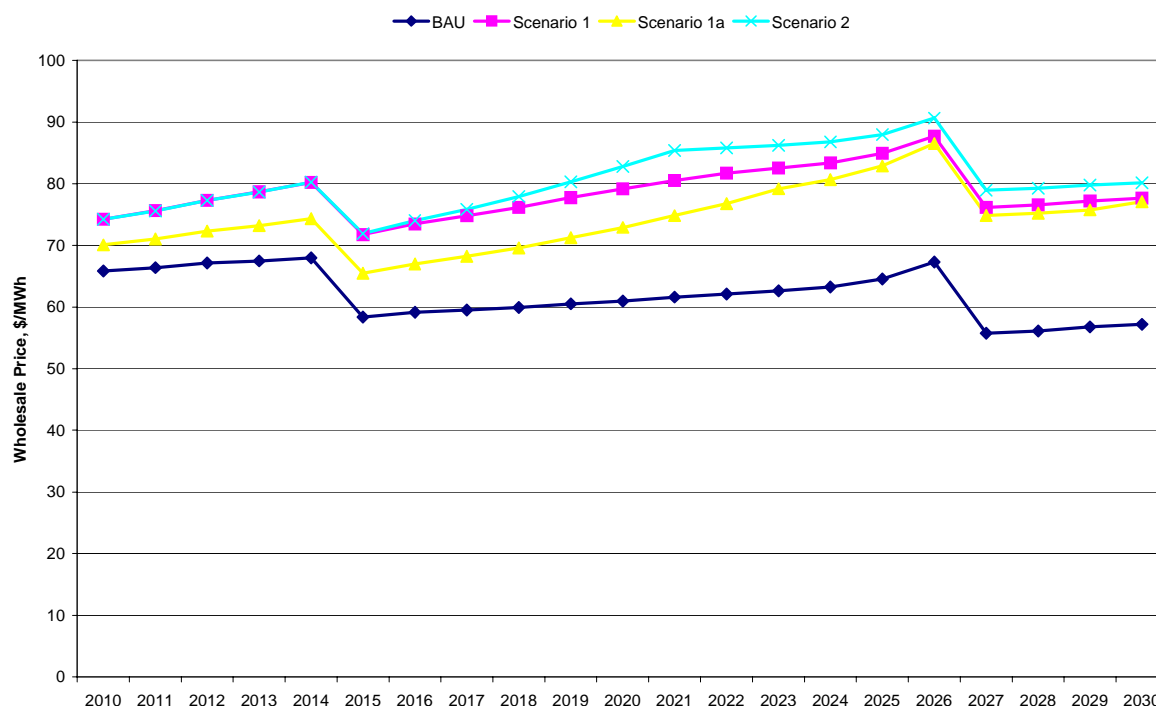
**Figure 6-5: Estimated wholesale prices—SWIS**



Source: MMA (2006), *Impacts of a National Emissions Trading Scheme on Australia's Electricity Markets*.

In the DKIS, over the period 2010-30 wholesale prices are expected to be on average 27% and 30% higher than the business as usual prices in Scenarios 1 and 2, respectively. With the enhanced energy efficiency and biosequestration offsets in Scenario 1a, the wholesale price increases compared with business as usual are expected to be smaller, down from an average of 27% in Scenario 1 to an average of 20% in Scenario 1a.

**Figure 6-6: Estimated wholesale prices—DKIS**



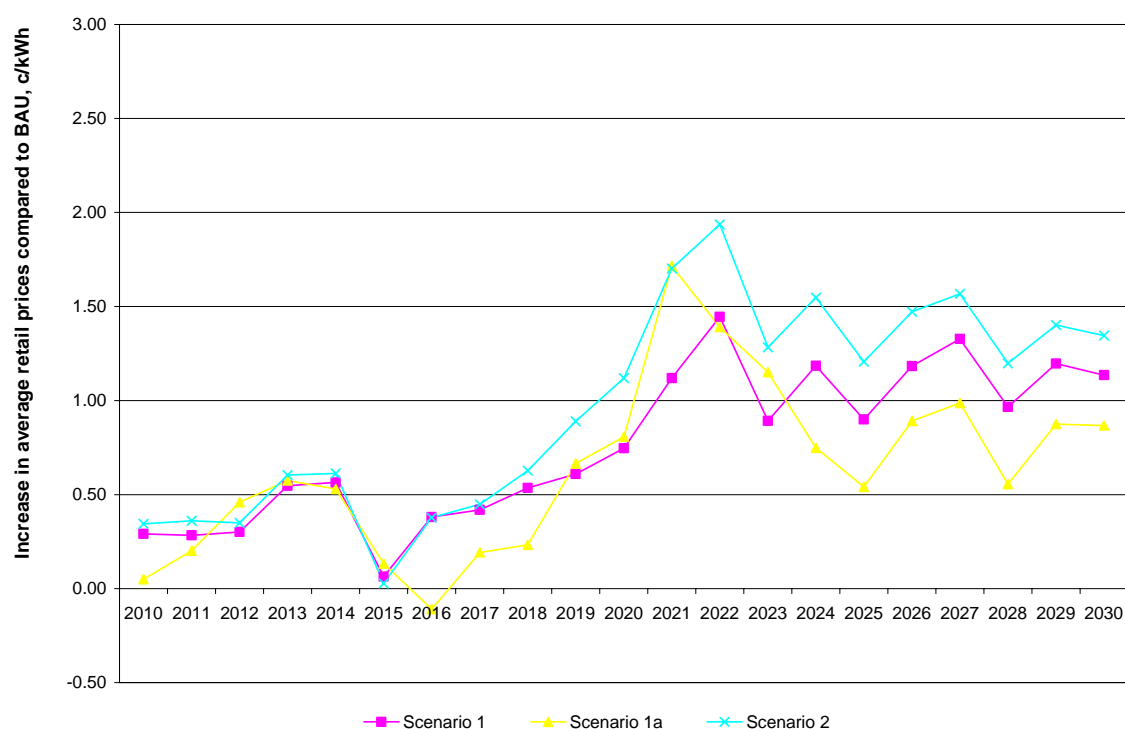
Source: MMA (2006), *Impacts of a National Emissions Trading Scheme on Australia's Electricity Markets*.

### Retail prices

The impact of an emissions trading scheme on retail prices is lower than that on wholesale prices because the cost of electricity is only part of the total retail price to consumers.

As shown in Figure 6-7, in the NEM in Scenario 1, average retail prices (weighted by customer class) are expected to be around 0.43 c/kWh higher than business as usual prices in the period to 2020. (This means that average annual retail prices in Scenario 1 would be around 7% higher than their average annual levels in the business as usual case.) Scenario 1 prices then increase gradually to be about 1.14 c/kWh higher than the business as usual prices from 2021 to 2030. With additional complementary measures (Scenario 1a), the expected increase in retail prices compared to business as usual is smaller, around 0.34 c/kWh higher than prices in business as usual in 2010–20, and around 0.97 c/kWh higher than prices in business as usual in 2021–30. In Scenario 2, average retail prices (weighted by customer class) are expected to be on average 0.52 c/kWh higher than business as usual prices in the period 2010–20 and on average 1.47 c/kWh higher than business as usual prices in the period 2021–30 in Scenario 2 (Figure 6-7).

**Figure 6-7: Estimated increases in weighted average retail prices compared with BAU—NEM**



Source: MMA (2006), *Impacts of a National Emissions Trading Scheme on Australia's Electricity Markets*.

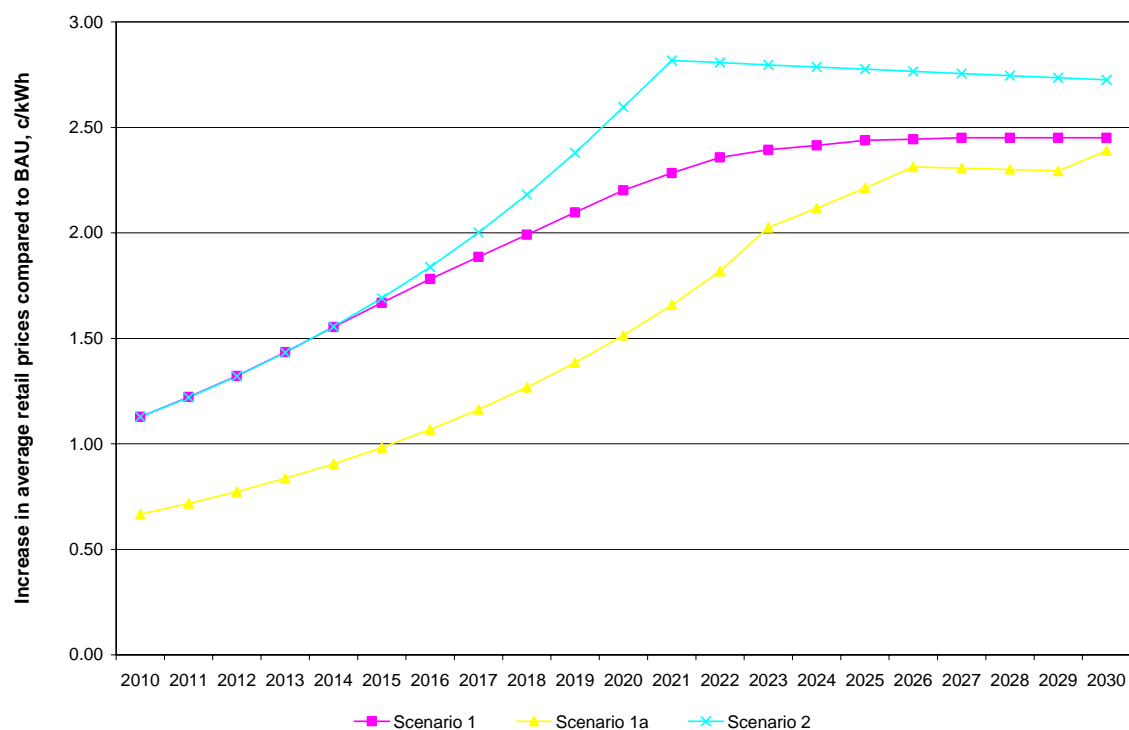
As shown in Figure 6-8, in the SWIS in Scenario 1, retail prices are expected to be on average 1.66 c/kWh higher than business as usual prices in the period 2010–20 and 2.41 c/kWh higher than business as usual prices in the period 2021–30. In Scenario 1a, the average impact on retail prices is less, resulting in an increase in prices on average of around 1.03 c/kWh 2010–20 and around 2.14 c/kWh in 2021–30 compared with business as usual. In Scenario 2, the retail prices are expected to be on average 1.76 c/kWh higher than business as usual prices in the period 2010–20 and 2.77 c/kWh higher than the business as usual prices in the period 2021–30 for Scenario 2 (Figure 6-8).

The estimated increase in retail price applies only to customers connected to the SWIS, which covers customers located in the south west corner of Western Australia. The price increase would not necessarily be as high in other regions of Western Australia (if they were included in a national emission trading scheme) due to predominant use of gas and liquid fuels in those regions. Those fuels have a lower emission intensity from combustion than the coal fired plant that supply a large part of the load in the SWIS.

The high increase in the SWIS is due to the fact that there is a high level of fuel switching such that coal plant are setting the price at the margin for a higher proportion of dispatch intervals. However, there is a likelihood that the price increase in Western Australia relative to the price increase in other jurisdictions may be significantly lower than estimated due to the following reasons<sup>77</sup>:

- Conservative assumptions were used on the uptake of energy efficiency options and new low emission fossil fuel technologies in Western Australia. Higher uptake would have led to a lower wholesale price increase due to emissions trading and thereby a lower retail price increase.
- Existing fuel contract commitments may differ from those assumed.
- Restrictions on the uptake of renewables may differ from those assumed and result in more renewable energy generation entering the region and displacing fossil fuel generation.
- Coal prices and gas prices may differ from those assumed and reduce the proportion of time that coal plant set the price in the wholesale electricity market.

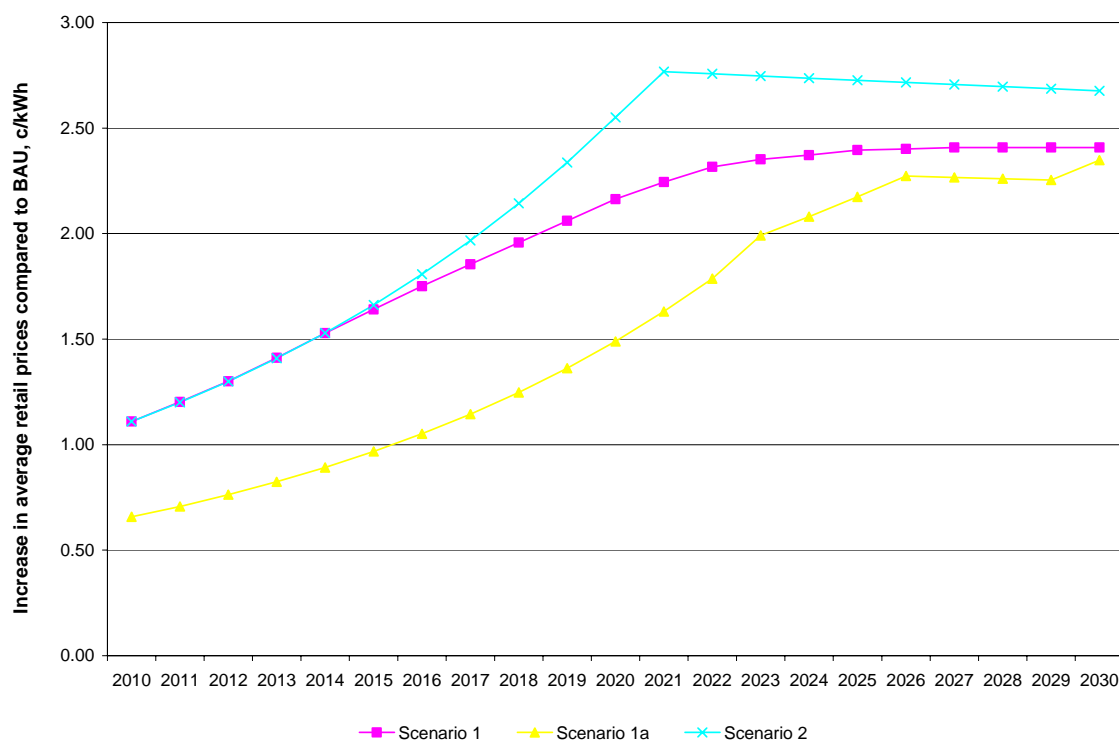
**Figure 6-8: Estimated increases in weighted average retail prices—SWIS**



<sup>77</sup> These issues are discussed further in MMA (2006), *Impacts of a National Emissions Trading Scheme on Australia's Electricity Markets*.

As shown in Figure 6-9, in the DKIS, average retail prices in Scenario 1 are estimated to be around 1.63 c/kWh higher than business as usual prices in the period 2010–20 and 2.37 c/kWh higher than business as usual prices in the period 2021–30. In Scenario 1a, the average impact on retail prices is less, resulting in an increase in prices on average of around 1.01 c/kWh in the period 2010–20 and around 2.11 c/kWh in the period 2021–30 compared with business as usual. In Scenario 2, average retail prices are expected to be around 1.73 c/kWh higher than the business as usual prices in the period 2010-20 and 2.72 c/kWh higher than the business as usual prices in the period 2021–30.

**Figure 6-9: Estimated increases in weighted average retail prices compared with BAU prices—DKIS**



The average retail prices discussed above are weighted averages for different customer classes. Retail price impacts would be expected to vary by customer class because the wholesale price comprises a different proportion of their energy bills.

The retail price impact would be largest for industrial customers in percentage terms because the wholesale price is typically a higher proportion of the total retail price for these customers. For example, some large industrial loads are connected directly to the transmission system, and so avoid distribution charges, which typically account for a significant proportion of a residential electricity bill.

As discussed in Chapter 7, it is proposed that free permits be allocated to trade-exposed, energy-intensive customers to offset the increase in their energy costs. Assuming the permit prices projected in Figure 6-1 and a 6% real discount rate, the amount of assistance for energy-intensive customers has been estimated to be in the order of between 20% and 25% of total permits issued for the period 2010–30.

For residential and commercial customers, the relative increase in retail prices is lower. Also discussed in Chapter 7 is the potential for revenue from permit auctions to be used by State and Territory Governments to assist these customers.

The additional average weekly expenditure on electricity by residential customers<sup>78</sup> compared with business as usual, averaged over the period from 2010–30, varies by jurisdiction (see Table 6-1):

- \$1.00 per week in Victoria to \$3.20 per week in the Northern Territory for Scenario 1.
- \$0.70 per week in South Australia and Victoria to \$2.20 per week in the Northern Territory for Scenario 1a.
- \$1.20 per week in Victoria to \$3.60 per week in the Northern Territory for Scenario 2.

The relative increase across the States and Territories reflects both the variation in the relative increase in electricity prices as a result of emissions trading and variations in the amount of electricity used by households across the jurisdictions. States and Territories with relatively higher levels of electricity consumption at the household level (for example, Tasmania, Northern Territory, Queensland and New South Wales) have a higher relative increase in average weekly expenditure than States with relatively low levels of electricity consumption (usually States with a high proportion of households connected to gas networks such as Victoria and South Australia). Impacts across regions within States and Territories also varied with some being more adversely affected than others.

### **6.3.4 Changes in capacity mix**

In the business as usual base case, very little new base load capacity is assumed to be required in Australia before 2020. This reflects the current surplus of base load capacity, as well as the opportunity faced by some generators to upgrade their facilities and increase their capacity (to a limited extent). The change in the mix of generation is expected to follow the same broad trends in Scenarios 1 and 2 (although the changes are more pronounced in Scenario 2). The discussion below focuses on the results in Scenario 1.

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<sup>78</sup> The additional average weekly expenditure on electricity was calculated by multiplying the weekly average consumption of electricity by States (as published by the ESAA) multiplied by the average increase in retail electricity prices in \$/MWh. For the NEM, an average increase in retail prices across all NEM States was used.



**Table 6-1: Additional expenditure by residential customers, \$/week**

	Scenario 1		Scenario 1a		Scenario 2	
	2010-20	2021-30	2010-20	2021-30	2010-20	2021-30
Queensland	0.78	1.80	0.61	1.38	0.91	2.29
NSW/ACT	0.80	1.84	0.62	1.42	0.94	2.34
Victoria	0.59	1.36	0.46	1.05	0.69	1.73
South Australia	0.65	1.50	0.51	1.15	0.76	1.90
Tasmania	1.05	2.42	0.82	1.86	1.23	3.07
WA	1.85	2.69	1.08	2.09	1.96	3.08
NT	2.65	3.84	1.54	2.99	2.80	4.41

Source: MMA (2006), *Impacts of a National Emissions Trading Scheme on Australia's Electricity Markets*.

Figure 6-10 shows the forecast change in the mix of generation capacity in Scenario 1.

A key feature of the forecasts is that there is an increase in renewable generation capacity relative to business as usual, reaching around 2,200 MW of total installed capacity by 2030. By comparison, total new renewable generation capacity is estimated to be around 800 MW by 2030 under business as usual. The increase in renewable generation capacity is driven by higher electricity prices and the estimated fall in the cost of renewable technologies. This new capacity is largely sourced from biomass and wind, but some hydro-electric facilities are also upgraded.

Less new black coal capacity is added in Scenario 1 compared with the business as usual base case. In the period 2016–19 new black coal capacity is displaced by new high efficiency natural gas plant. After 2020, new black coal capacity is added, which takes the form of integrated gasification combined cycle (IGCC) plant combined with carbon capture and storage in some states. Capacity of black coal plant is slightly affected after 2020 compared with the base case because the increase in energy efficiency induced by emissions trading lowers demand growth somewhat and delays the need for new black coal plant by around one to two years.

Increments in brown coal capacity are estimated to be brought forward during 2022-26 compared with the business as usual base case. This is due to the fact that permit prices rise to around \$30/t CO<sub>2</sub>-e and encourage IGCC with carbon capture and storage to be installed one or two years earlier than new brown coal capacity would otherwise be required under business as usual.

Natural gas fired generation capacity increases slightly compared to business as usual in the period 2010–30. New gas fired generation plants are predicted to be built in all electricity markets in the period to 2020 under business as usual. The modelling indicates that under business as usual there is a need for intermediate plant in the NEM in the period to 2020 (for which gas-fired generation is the economic choice or is needed to meet the requirements of the Queensland 13% Gas Scheme). With emissions trading, the new gas plant entering the market would, over time, operate more like base load plant than intermediate plant.

The only additional gas fired plant in Scenario 1 compared with business as usual occurs in south east Queensland, where two new combined cycle plants are estimated to replace brown field expansions of black coal plant in the Surat Basin.

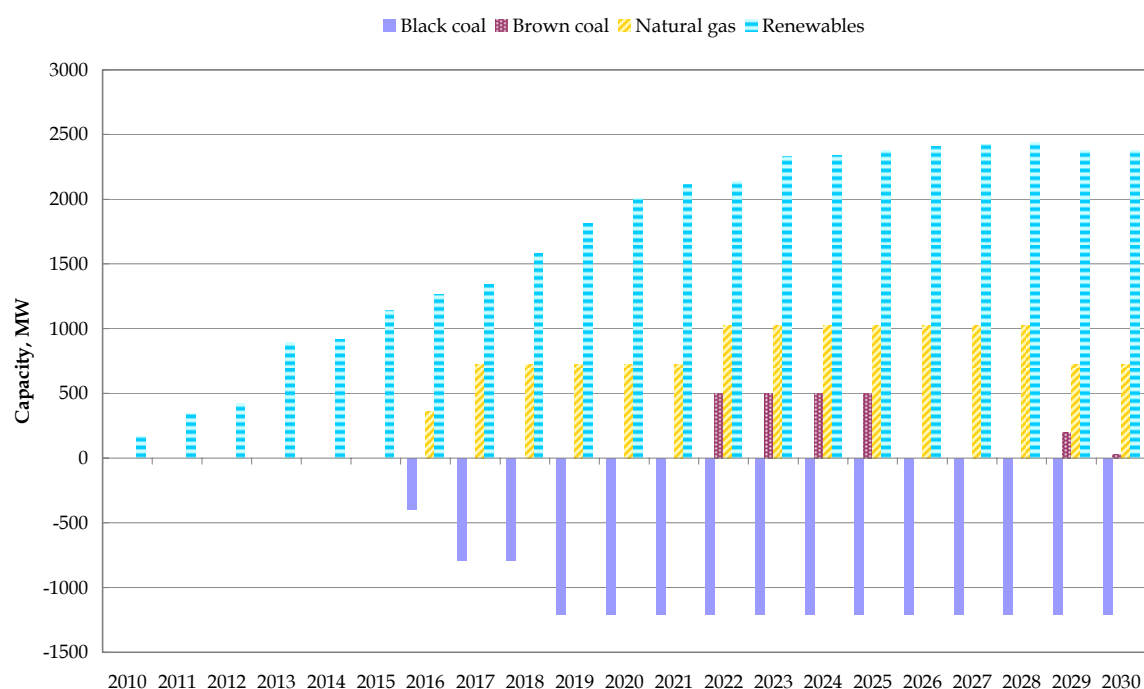
Beyond 2020, projected higher gas prices and the projected commercialisation of IGCC technology leads to a shift back towards coal as the preferred fuel for base load plant, especially in Queensland, NSW and Victoria. The preference of these technologies over gas fired plant is maintained under the scenarios modelled because of the low emission intensities of these technologies (relative to conventional coal generation technologies) and the potential to include carbon capture and storage at the permit prices under each cap.

In the SWIS, under assumed gas prices, natural gas fired cogeneration plant is the preferred plant under business as usual even for base load. However, significantly higher prices could change this result. In any case, no new base load plant is required until well into the next decade as a result of a surplus of new base load capacity entering the market over the next three years.

The key findings of the modelling include:

- *Investment in new coal-fired capacity is lower under emissions trading than in the business as usual base case.* This mainly arises over the next decade, and occurs when new natural gas fired capacity replaces mainly new black coal fired generation. There is also a modest increase in the level of renewable energy capacity entering the market as a result of the higher electricity prices, displacing coal-fired capacity.
- *The level of brown coal capacity still increases with emissions trading, but at a lower rate.* This result depends crucially on the assumptions as to when the cost of IGCC technology is competitive relative to conventional coal technologies. It has been assumed that the cost of carbon capture and storage decreases to a point where IGCC plus carbon capture and storage is economic at carbon prices of between \$30/t CO<sub>2</sub>-e and \$35/t CO<sub>2</sub>-e.
- *Energy efficiency has the largest impact on the timing and amount of new capacity.* With higher levels of energy efficiency in the complementary policy measures sensitivity (Scenario 1a), the lower level of demand results in less need for new plant, particularly less natural gas-fired capacity relative to the business as usual scenario.

**Figure 6-10: Cumulative change in generation capacity mix, Scenario 1 compared with BAU**



Source: MMA (2006), *Impacts of a National Emissions Trading Scheme on Australia's Electricity Markets*.

### 6.3.5 Changes in generation output by technology type

Although there is not much change in generation capacity, there is a substantial change in the amount generated by each technology type relative to business as usual (see Figure 6-10 and Figure 6-11, and Figure 6-12 and Figure 6-13). In the period 2010–30, coal fired generation output is reduced relative to business as usual by up to 30% in Scenario 1 and 37% in Scenario 2. The largest reductions occur in NSW, although in proportional terms the largest reduction occurs in Western Australia where coal fired generation is effectively halved compared with the base case levels of output.

The estimated reduction in coal fired generation relative to business as usual is explained by:

- *An increase in gas-fired generation.* The permit prices allow the higher cost coal-fired generation to be displaced by efficient gas-fired generation from combined cycle technologies. This factor wanes over time as gas prices are predicted to increase.

- *Lower electricity demand through energy efficiency improvements by end users.* This accounts for one-fifth to one-third of the estimated reduction in coal fired generation.
- *An increase in the level of renewable generation as a result of substantial new capacity in renewable generation.*

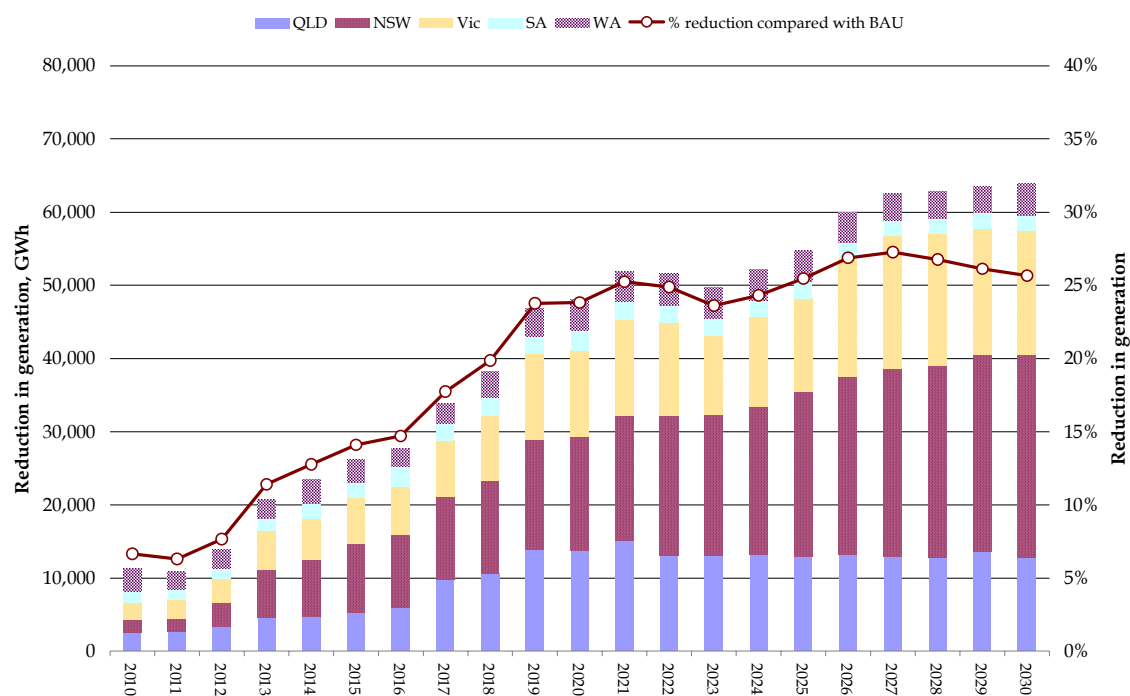
To the extent that emissions trading reduces the output of existing brown and black coal generators compared with business as usual and results in any net loss in profits, those impacts could be mitigated through the allocation of permits. In particular, it is proposed that free permits are allocated to existing generators at the commencement of the scheme, sufficient to offset any estimated net loss in profits as a result of the emissions trading scheme for the period 2010–30 (Chapter 7). All other existing generators and new generators are assumed to buy permits from the market to cover their emissions.

Indicative estimates suggest that in the order of between 60% and 70% of the total value of permits issued for the period 2010–30 may need to be allocated to achieve such an objective (assuming compensation is based on individual power stations) in the scenarios modelled. These losses may overestimate the true losses faced by many generating companies because some companies have a portfolio of units, some of which have increased profits and some of which have reduced profits. If compensation were based on generation portfolios, then the level of compensation is estimated to be almost halved.

Although the level of gas fired generation increases nationally relative to business as usual, the level of gas-fired generation decreases in some states (Victoria and South Australia) as a result of the reduction in demand caused by increased energy efficiency by end-users.

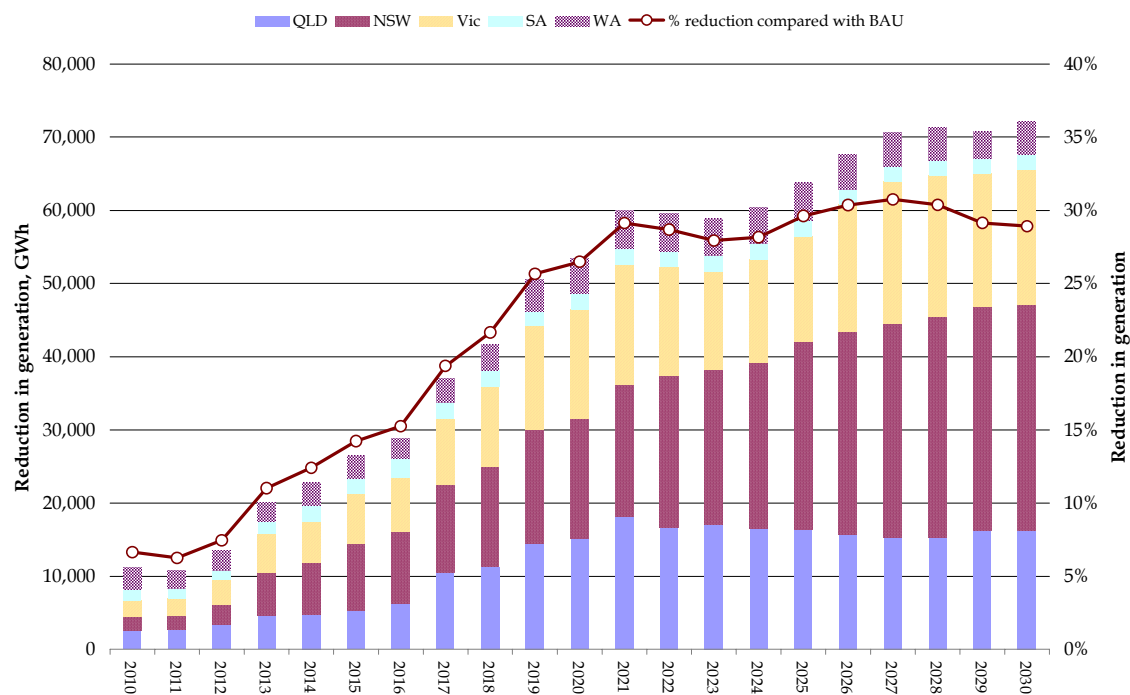
Renewable generation is projected to increase overall relative to business as usual. However, there is a reduction in hydro-electric generation in NSW and Queensland as a result of the reduction in generation from pumped storages associated with the Snowy Mountains Scheme and Wivenhoe. The profit margin on pumped storage operation is reduced with emissions trading as the cost of purchasing power in off-peak periods to pump water (when high emission intensive coal plant set the price) increases more than the price received for selling energy in peak periods.

**Figure 6-10: Scenario 1 compared with BAU—reduction in coal-fired generation**



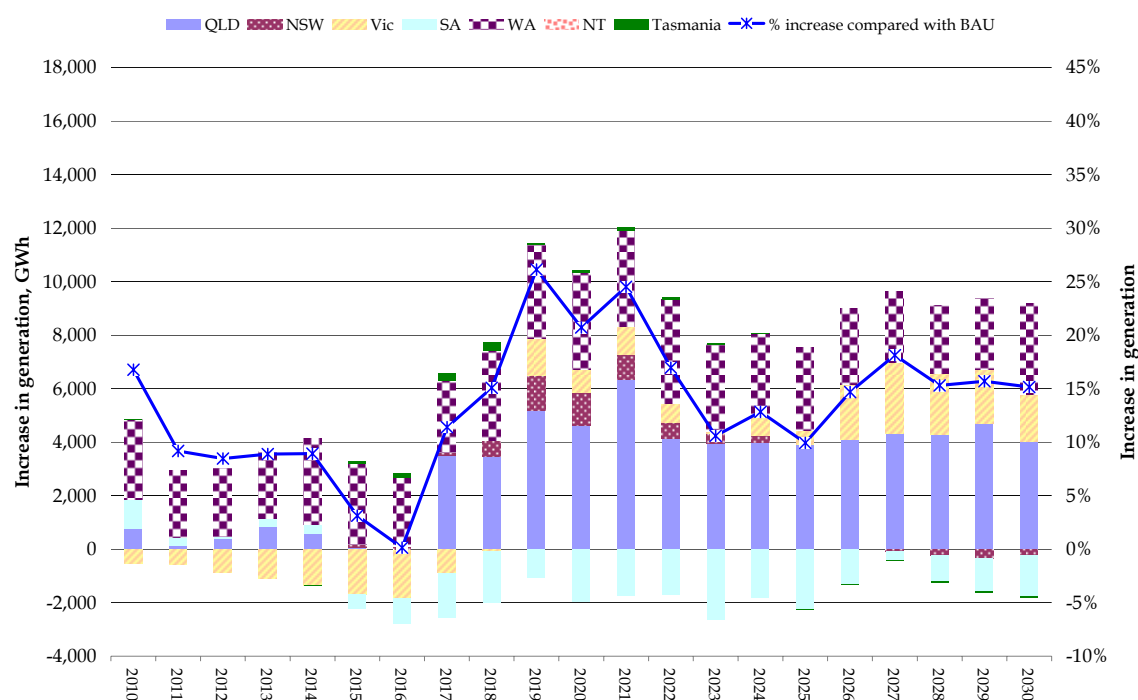
Source: MMA (2006), *Impacts of a National Emissions Trading Scheme on Australia's Electricity Markets*.

**Figure 6-11: Scenario 2 compared with BAU—reduction in coal-fired generation**



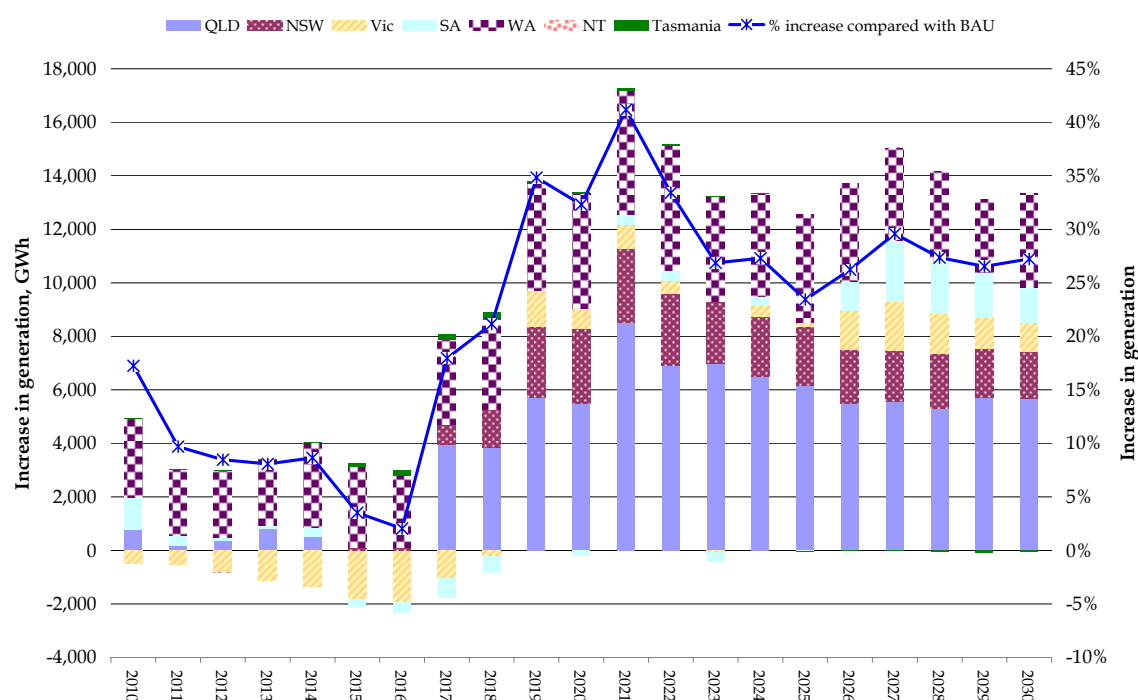
Source: MMA (2006), *Impacts of a National Emissions Trading Scheme on Australia's Electricity Markets*.

**Figure 6-12: Scenario 1 compared with BAU—increase in gas-fired generation**



Source: MMA (2006), *Impacts of a National Emissions Trading Scheme on Australia's Electricity Markets*.

**Figure 6-13: Scenario 2 compared with BAU: increase in gas fired generation**



Source: MMA (2006), *Impacts of a National Emissions Trading Scheme on Australia's Electricity Markets*.

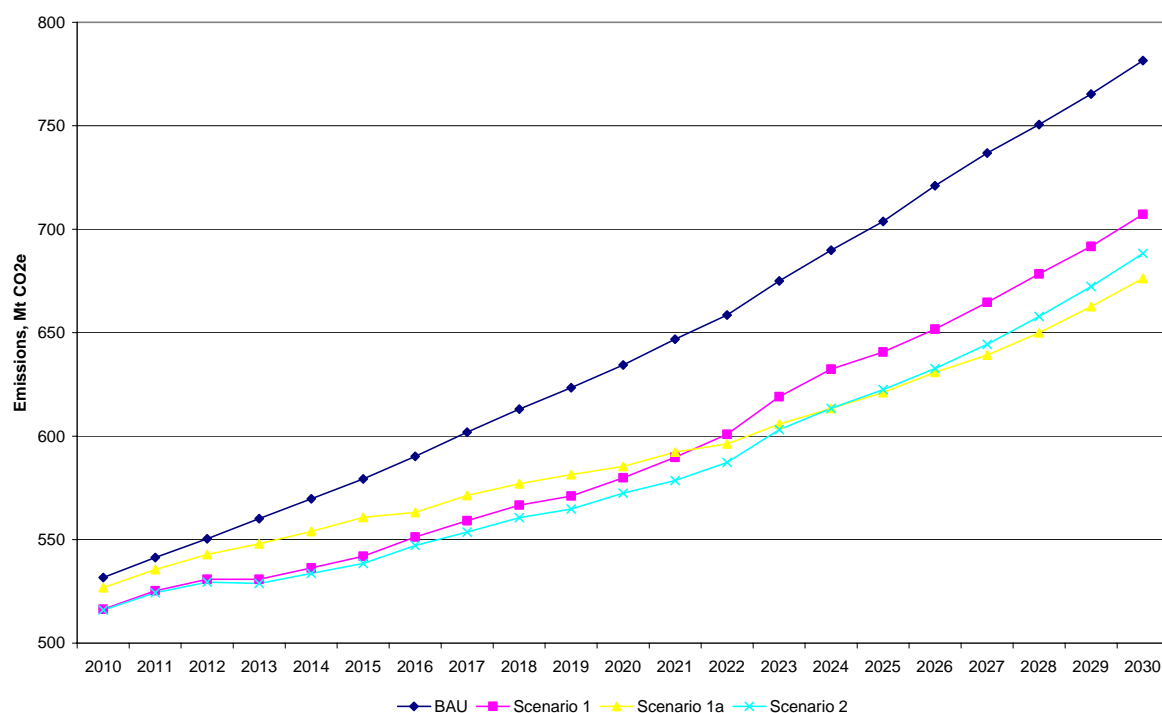
## 6.4 Results of economy-wide modelling

This section analyses the results and key findings of the economy-wide modelling, including the effects of the scenarios on GDP, consumption, the labour market and certain industry sectors. It also discusses the sensitivity of those results to assumptions of enhanced energy efficiency, offsets and induced technological change.

### 6.4.1 Emissions

Figure 6-14 shows the impact of the scenarios on national greenhouse gas emissions. Australia's emissions would have been 782 Mt in 2030 under business as usual. By comparison, emissions are 710 Mt and 694 Mt in 2030 in Scenarios 1 and 2, respectively. The stimulation of greater energy efficiency and offsets in Scenario 1a reduces emissions from 710 Mt to 693 Mt in 2030, relative to Scenario 1. As discussed above, annual abatement in Scenario 1a exceeds that of Scenario 1 from around 2023 because energy efficiency and biosequestration opportunities are assumed to increase significantly post 2020. This makes the abatement task *easier* during this period such that the same emissions caps can be met at a lower cost.

Figure 6-14: National emissions



Source: The Allen Consulting Group (2006), *The Economic Impacts of a National Emissions Trading Scheme*.

The relatively higher permit prices in Scenario 2 drive greater displacement of coal fired generation for combined cycle gas and renewables generation, which results in cumulative economy-wide abatement of 1,005 Mt by 2030. The level of cumulative abatement is lower in Scenario 1, at 940 Mt, due to lower permit prices. The complementary policy measures scenario (Scenario 1a) has the same overall cap in emissions as Scenario 1 and therefore is expected to result in near identical cumulative abatement as that scenario.

The majority of abatement in all modelled scenarios comes from the stationary energy sector (the only sector directly affected by the emissions prices).

#### **6.4.2 GDP**

The permit price scenarios are expected to see GDP continue to grow in line with business as usual.

Under business as usual (BAU), GDP is expected to grow at a compound annual growth rate (CAGR) of 3.1% to 2020, and 2.6% to 2030. Figure 6-15 shows that there is little difference between the scenario outcomes and BAU. The time required to recover BAU growth at 2020 is approximately 1.9 months in Scenario 1 and 2.2 months in Scenario 2.

Additional complementary policy measures could further reduce the already small impact on GDP. GDP in this scenario (Scenario 1a) is expected to be 0.3% less than BAU at 2020 and 0.4% at 2030, compared with 0.4 and 0.5% under Scenario 1, respectively. The time required to recover BAU growth at 2020 is reduced from around 1.9 months in Scenario 1 to 1.3 months in Scenario 1a.

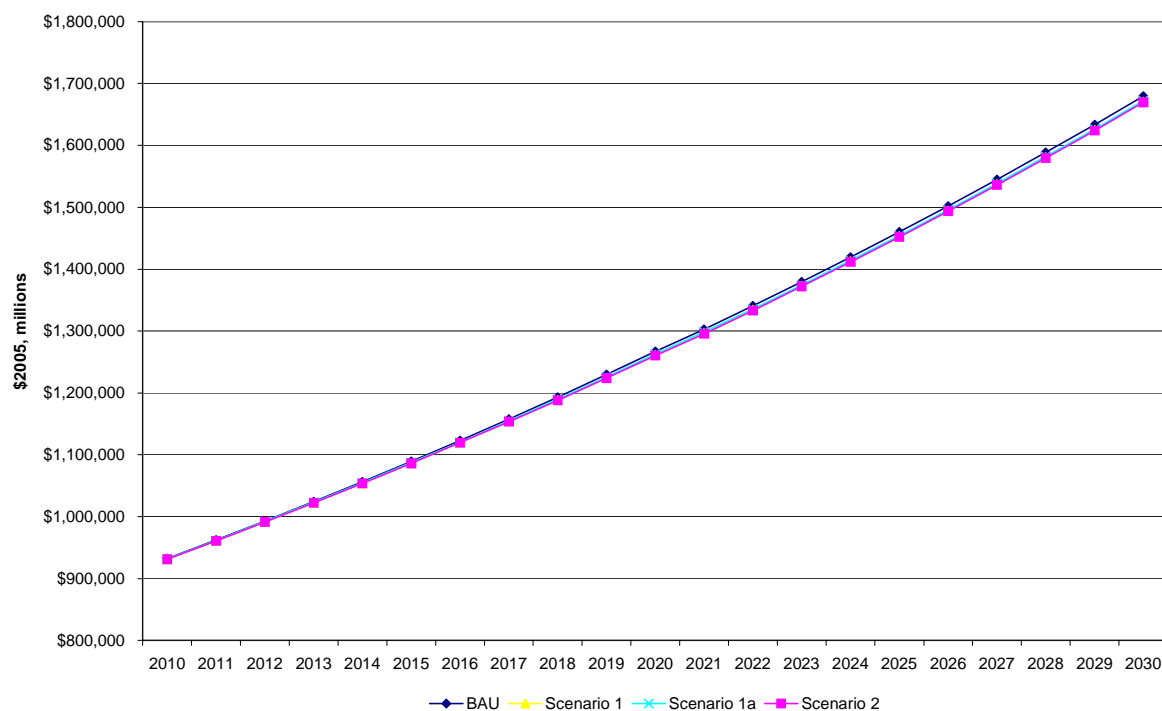
#### **6.4.3 Consumption**

The permit prices in all scenarios are expected to result in little change in private consumption growth, a measure of economic welfare, relative to the BAU. Under BAU, consumption is expected to grow at a CAGR of 2.8% to 2020 and 2.4% to 2030 (Figure 6-16). The outcomes of each of the scenarios are effectively identical to the BAU.

Additional complementary policy measures (Scenario 1a) result in additional demand side response, which reduces total energy consumption and mitigates the impact of higher electricity prices for business and households. Consumption in this scenario is around 0.4% less than BAU expectations in 2020 compared with 0.6% in Scenario 1.

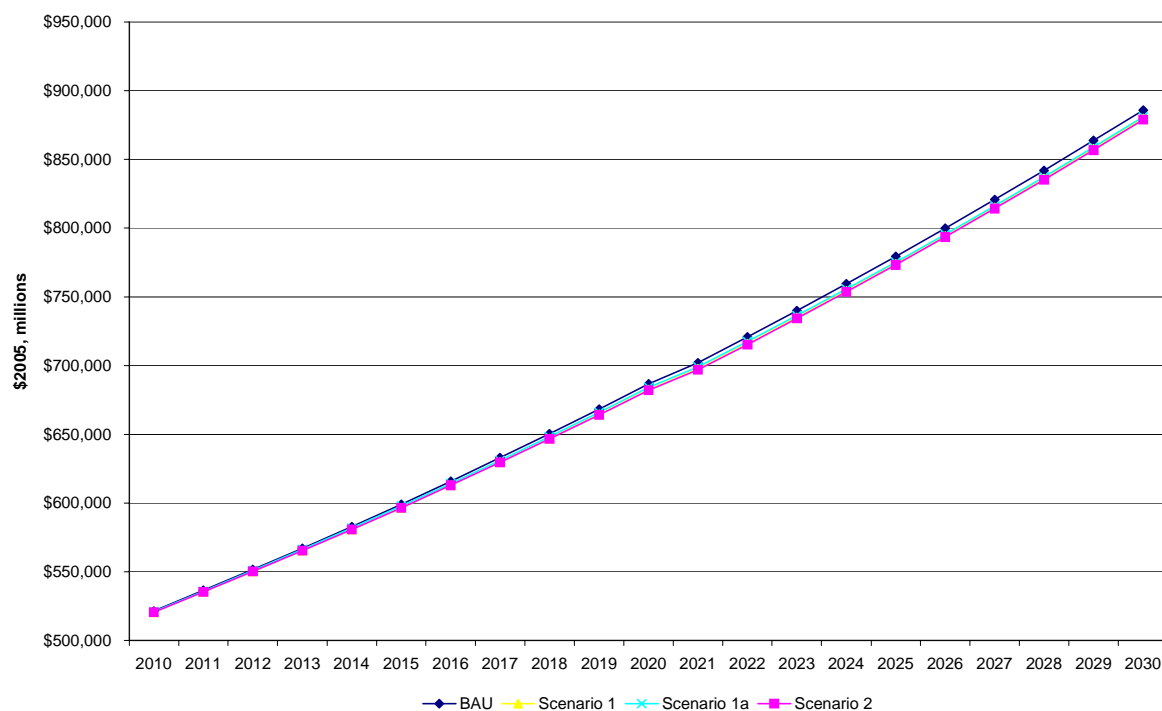


**Figure 6-15: Absolute GDP levels**



Source: The Allen Consulting Group (2006), *The Economic Impacts of a National Emissions Trading Scheme*.

**Figure 6-16: Absolute consumption Levels**



Source: The Allen Consulting Group (2006), *The Economic Impacts of a National Emissions Trading Scheme*.

#### **6.4.4 Labour market effects**

The MMRF-Green model assumes that in the long run, wages adjust so that employment levels will always return to long run average levels. As permit prices increase this is expected to result in an initial and growing reduction in the profitability of energy-using industries and depress employment growth relative to business as usual. The modelling assumed that the rate of change in employment levels adjusted so that the labour market effects were largely eliminated after around five years. However, wages growth would slow marginally in line with other economic impacts.

#### **6.4.5 Industry impacts**

The industry impacts of the *indicative* scenarios are shaped by export prospects, domestic demand for goods and services, and industry competitiveness. Table 6-4 summarises the results for the top ten expanding and contracting industries for each scenario at 2020 compared with business as usual.

The industry predicted to experience the greatest growth compared with business as usual in all scenarios is the renewable generation industry. The renewables sector would be expected to expand by over 400% (an absolute change of around \$800 million in production value) at 2020 in Scenarios 1 and 2. This strong growth is off a small base and is driven by the permit prices making renewables more competitive in the electricity market.

The electricity-gas (i.e., gas-fired electricity generation) sector would be expected to increase in Scenarios 1 and 2. Like renewables, this expansion is driven by permit prices, which make this sector increasingly competitive.

The growth in this sector does not occur with additional complementary policy measures (Scenario 1a) because the additional demand side response reduces total energy consumption and gas output. As a result, this sector contracts by \$130 million relative to business as usual at 2020. This contraction is smaller than that for coal-fired electricity, at \$692 million. After 2023, higher permit prices make gas-fired electricity relatively more competitive than in business as usual, resulting in subsequent expansion above business as usual.

Output in the forestry products industry is expected to expand in all scenarios. The expansion is greatest in Scenario 1a, where enhanced uptake of biosequestration offsets for a given carbon price results in the industry expanding by around 50 per cent to approximately \$1.2 billion by 2030.

The coal-fired electricity sector is projected to grow at a slower rate than business as usual in all scenarios. The impact is greatest in Scenario 2 due to higher permit prices brought about by the more stringent cap on emissions in the electricity sector. Nevertheless, coal

continues to be the dominant source of electricity, accounting for around 54% of electricity supplied by 2030 (compared with 75% under business as usual).

Other services linked to overall levels of economic activity and new investment, such as transport services, building products and cement manufacture, would be projected to grow slightly more slowly than in business as usual in all scenarios.

The alumina and aluminium industry is not adversely affected by the rise in energy prices, as this has been offset by a free allocation of permits (modelled as a production subsidy).

## **6.5 Caveats on modelling results**

The results presented in this Chapter are a function of the underlying assumptions. Some of the more important caveats are that:

- Future generation supply options and cost are inherently uncertain. A conservative approach has been taken in the estimation of such costs.
- Gas prices over the modelling period are uncertain, which can have implications for the relative take-up of gas-fired plant and permit prices.
- Electricity demand to 2030 is uncertain.
- Many flexibility mechanisms have been excluded from the modelling. Only offset credits from forestry have been included, under conservative assumptions on their availability. No other offset credits have been assumed in the modelling. Also, no allowance has been made for the use of international offset credits, such as those created under the Clean Development Mechanism (CDM). While these have been excluded from the modelling, an option canvassed in this Discussion Paper would be to allow some such credits to be recognised by the Australian scheme, which could lower overall compliance costs.
- The economy wide modelling assumes no impacts of climate change itself. If widespread international action is not taken to reduce greenhouse gas emissions, it is likely that some changes would occur to the costs and sizes of different industries, such as agriculture or tourism.
- At this stage, the outputs of the MMRF-Green model have not been fed back into the MMA model. Additional iterations would need to be undertaken as part of further modelling.
- The economic modelling does not incorporate the economic benefits of cutting emissions to reduce the rate of climate change. Consequently, the modelling is an assessment of the economic costs of reducing the quantity of emissions rather than a cost-benefit analysis which would also seek to value the benefit of minimising climate change.

## 6.6 Conclusion

The NETT has undertaken preliminary modelling of the potential implications of *indicative* scheme caps on the electricity sector and the broader Australian economy. Overall, the results of the modelling indicate that addressing climate change through a carefully designed emissions trading scheme could result in the economy continuing to grow strongly. Importantly, it would appear that some industries and regions most vulnerable to the effects of introducing an emissions trading scheme—trade-exposed, energy-intensive industries—can be successfully sheltered from the impacts of the scheme in a way that maintains their competitiveness but does not limit the amount of abatement that occurs (Chapter 7).

The results presented in this Chapter are dependent on the:

- amount of abatement targeted and the timeframe for such reductions
- coverage of the scheme
- availability of new low emissions technologies
- availability and effectiveness of complementary policies such as energy efficiency.

ABARE published a report on economic modelling of international climate change policy that examines the role of technology and economic instruments.<sup>79</sup> The report analyses six global greenhouse gas emission reduction scenarios aimed at setting the world economy on emission pathways that would reduce greenhouse gas emissions in 2050 by around 40 per cent relative to business as usual.

Both the preliminary modelling undertaken by the Taskforce and that undertaken by ABARE explore the relationship between technology and achieving emissions reductions. In particular, the Taskforce's modelling considers how emissions trading can assist the deployment of low emission technologies, such as IGCC and CCS. Whilst there are some broad similarities in the modelling approach adopted by the Taskforce and the ABARE report<sup>80</sup>, the differences<sup>81</sup> in the modelling approach and assumptions mean that the

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<sup>79</sup> Ahammad, H., Matysek, A., Fisher, B.S., Curtotti, R., Gurney, A., Jakeman, G., Heyhoe, E. and Gunasekera, D. 2006, *Economic Impact of Climate Change Policy: The Role of Technology and Economic Instruments*, ABARE Research Report 06.7, Canberra, July.

<sup>80</sup> The broad similarities between the two approaches include: the introduction of a carbon price (an emissions trading scheme and a carbon tax have been treated as equivalent in their ultimate economic impacts); effects of climate change (the effects and costs of climate change itself have not been modelled); use of computable general equilibrium (CGE) models (the national economy is modelled using a CGE framework); and focus on technology in the electricity generation sector (electricity generation is assumed to contribute the largest proportion of abatement due to the take-up of new technologies).

<sup>81</sup> The differences include: modelling timeframe (ABARE forecasts to 2050, whilst the Taskforce forecast to 2030); size of the abatement task (the Taskforce's estimates of Australian emissions under business as usual differ from those of ABARE's. Also, the Taskforce models greenhouse gas emission caps for

impacts are not directly comparable. In particular, the preliminary work undertaken by the Taskforce examines the impacts of a NETS operating in the stationary energy sector, while ABARE explores the impact of an international carbon tax. Also, the Taskforce's modelling specifically incorporates measures to protect the international competitiveness of Australia's trade-exposed, energy-intensive industries, which has not been explored in the ABARE modelling.

The modelling work undertaken to date is informative, but only a first step towards understanding the impacts of key design choices of the emissions trading scheme, such as the scheme cap and coverage. Further modelling is needed to inform decisions on a scheme design that best maintains Australia's economic prosperity and growth. To inform this next stage of modelling, stakeholder input is sought on all aspects of the modelling approach outlined in this Chapter—the modelling assumptions, methodologies, and the interpretation of the modelling results.

*Stakeholder comment is sought on the electricity sector and economy-wide modelling assumptions, methodology and results.*

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electricity generation sector, while ABARE modelled economy-wide and global abatement tasks); treatment of electricity generation sector (ABARE has not undertaken detailed 'bottom up' modelling of the electricity sector. The Taskforce has undertaken this modelling which provides much greater detail on domestic transitional issues); energy efficiency (ABARE has not assumed any demand-side response to higher electricity prices than its standard assumption in relation to the elasticity of demand for electricity. By contrast, the Taskforce's modelling has assumed additional technological change in response to higher carbon prices); biosequestration (ABARE has assumed no availability of biosequestration offsets. By contrast, the Taskforce's modelling assumes biosequestration offsets); revenue recycling (ABARE recycles all tax revenue, or permit revenue, to households as a lump sum. In the Taskforce's economy-wide modelling, only the 'remainder' of permit revenue was recycled to households, as a lump sum – the bulk of permit value was allocated to incumbent generators and trade-exposed, energy-intensive industries); and treatment of trade-exposed, energy-intensive industries (the Taskforce's indicative scenarios recycle permit revenue to these industries, to offset the impact of higher energy prices. No such protection is afforded to those industries in ABARE's scenario 3, where Australia adopts stricter abatement targets than the rest of the world).

**Table 6-4: Top ten expanding and contracting industries at 2020 relative to the Business as Usual scenario**

Scenario 1				Scenario 1a			Scenario 2		
Top ten expanding industries		% change in output	Absolute change (\$m)			% change in output	Absolute change (\$m)		
1	Renewables (biogas,biomass, wind)	439.3	\$798	Renewables (biogas, biomass, wind)	309.8	\$553	Renewables (biogas, biomass, wind)	424.9	\$779
2	Electricity - gas	21.4	\$124	Forestry	16.8	\$122	Electricity - gas	29.0	\$171
3	Forestry	12.1	\$87	Alumina and aluminium	1.5	\$117	Forestry	24.1	\$175
4	Other mineral ore	0.9	\$92	Other mineral ore	0.9	\$93	Other mineral ore	0.9	\$90
5	Alumina and aluminium	0.7	\$59	Wood products	0.7	\$25	Alumina and aluminium	0.7	\$56
6	Iron ore	0.5	\$16	Manufacturing nec	0.4	\$32	Wood products	0.5	\$18
7	Iron and steel	0.4	\$21	Iron and steel	0.3	\$16	Iron ore	0.4	\$14
8	Oil	0.4	\$14	Other metal products	0.2	\$22	Iron and steel	0.4	\$18
9	Urban gas distribution	0.3	\$6	Fishing	0.2	\$4	Oil	0.4	\$13
10	Other metal products	0.3	\$26	TCF	0.2	\$7	Urban gas distribution	0.3	\$6

*Estimated impacts of addressing greenhouse gas emissions through the NETS*

Scenario 1			Scenario 1a			Scenario 2		
Top ten contracting industries	% change in output	Absolute change (\$m)		% change in output	Absolute change (\$m)		% change in output	Absolute change (\$m)
1 Electricity – coal	-21.7	-\$870	Electricity - gas	-22.2	-\$130	Electricity – coal	-24.0	-\$958
2 Electricity supply	-7.7	-\$581	Electricity - coal	-17.5	-\$692	Electricity supply	-8.8	-\$668
3 Electricity - hydro	-7.3	-\$52	Electricity supply	-10.6	-\$813	Coal	-3.4	-\$462
4 Coal	-3.0	-\$402	Electricity – hydro	-8.1	-\$58	Electricity - hydro	-1.8	-\$10
5 Chemical products excluding petrol	-1.4	-\$110	Coal	-2.5	-\$339	Chemical products excluding petrol	-1.7	-\$128
6 Food products – animal	-0.6	-\$36	Gas	-1.6	-\$159	Food products – animal	-0.7	-\$44
7 Building products (not cement & metal)	-0.5	-\$21	Chemical products excluding petrol	-0.9	-\$66	Food products – other	-0.7	-\$59
8 Cement	-0.5	-\$12	Rail transport services	-0.9	-\$61	Cement	-0.6	-\$13
9 Food products – other	-0.5	-\$46	Food products – other	-0.4	-\$31	Building products (not cement & metal)	-0.6	-\$23
10 Private transport services	-0.5	-\$117	Food products – animal	-0.3	-\$23	Construction services	-0.6	-\$436

Source: The Allen Consulting Group (2006), *The Economic Impacts of a National Emissions Trading Scheme*.

## **7 The nature of permits, permit allocation and assistance measures**

*Permit allocation is a critical issue in any cap and trade scheme. This Chapter considers what sorts of permits might be included in the national scheme, and how they are proposed to be allocated. It proposes that permit allocation should be the main mechanism via which assistance is provided to those likely to be most adversely affected by the implementation of the scheme.*

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### **7.1 Permits in the NETS**

At the heart of any emissions trading scheme is the tradable permit to emit. How permits are initially allocated throughout the economy can have significant efficiency and equity implications. This Chapter sets out the proposed approach to permit allocation, and describes how the relevant efficiency and equity considerations have been taken into account.

Permits themselves would exist electronically, and their ownership would be logged in an electronic registry in the same way that Renewable Energy Certificates (RECs), NSW and ACT Greenhouse Abatement Certificates (NGACs) and Gas Electricity Certificates (GECs) exist in their own respective registries currently.

### **7.2 A national approach to permit allocation**

This Chapter sets out a **national** approach to permit allocation. It is not proposed that different rules would apply to permit allocation in different States and Territories. The only area where differences in approach are contemplated is in relation to assistance measures for groups other than generators or trade-exposed, energy-intensive industries. In that case, assistance could be funded through **national** auction proceeds, divided among States and Territories.

### **7.3 The nature of permits: short term or long term?**

Permits could take a variety of forms. One option is for permits to be short-term, annual permits, each of which gives the holder the right to emit 1 tonne of CO<sub>2</sub>-e in a year. Another option is for permits to be long-term instruments, each of which gives the holder the right to emit 1 tonne of CO<sub>2</sub>-e in every year for a longer period of time, say, 10 to 20 years.

The pros and cons of short-term versus long-term permits (or a combination of the two) have been investigated in accordance with the sixth of the 10 key design propositions



agreed in March 2005 by First Ministers for further investigation, which states that:

Permit allocation be made on the basis of a mix of administratively allocated and auctioned permits, with both long- and short-term (annual) permits.

### **7.3.1 Why is permit length relevant?**

Long-term permits represent one possible mechanism to create a degree of long-term certainty for investors. This is because holders of long-term permits would know that they were entitled to continue to emit for as long as the permit was valid. Long-term permits could also provide a mechanism through which the market could express its views of longer-term emissions permit prices.

Long-term permits are not used in other emissions trading schemes. The EU ETS has only one form of permit: an annual permit. The North East US States' RGGI proposes also to have only annual permits.

Some submissions raised concerns about the possibility of having long-term permits as well as short-term permits. For example, the Australian Financial Markets Association (submission 51) and the Centre for Energy and Environmental Markets (submission 59) have concerns about the effects of having two different types of permit in one new market. In particular, they contend that having two separate **types** of permits would unnecessarily complicate the scheme and reduce liquidity and could prevent the establishment of a futures market. This is because if a company wanted to use, say, 5 years of a long-term permit but then sell the remainder, more complicated arrangements would need to be made to split this out than just selling extra longer-dated annual permits.

### **7.3.2 Can certainty be provided in other ways?**

From the views expressed in the submissions, it seems that most respondents appear to want **long-term certainty about permit allocation**, rather than long term permits *per se*.

Even if annual permits only are used, there is nothing preventing the allocation or auctioning of these permits many years in advance. For example, in 2010, permits could be allocated for as many future years as required. Permits for all years could be 'date-stamped'. For example, in 2010, some permits for 2015 could be issued. These permits would be date-stamped as 2015 permits, and could not be used before 2015. (However, they could be banked for future compliance beyond 2015.) The allocation and subsequent trading of at least some future-dated permits would allow the market to reveal expected emissions prices over time, and would facilitate the development of a futures market.

As discussed more fully in Chapter 10, there are several other features of the proposed scheme design that combine to create a greater degree of long-term certainty.

### **7.3.3 Conclusion on permit length**

It is proposed that just one form of permit—the annual permit—be issued. Each annual permit would be date-stamped with the first year on which it becomes valid (known as the permit’s vintage). Some annual permits would be issued in advance—in some cases, many years in advance. As outlined in Chapter 3, it is proposed to set firm caps for 10 years, and gateways for the following 10 years. Extensions to the gateways would be defined at 5-yearly intervals. There is no reason why permits could not be issued in advance up to the lower (that is, most stringent) level of the gateway.

*It is proposed that the scheme would have only one form of permit—the annual permit. Each annual permit would be marked with the first year on which it becomes valid (its vintage). Permits may be allocated many years in advance (up to the lower bound of established gateways).*

## **7.4 Permits as property rights**

It is proposed that permits be structured so as to give their holders firm property rights. This means that the holder of a permit has a clear right to emit. It also implies that any decision by governments to take away permits should be accompanied by compensation.

Failure to structure permits in this fashion would increase the uncertainty for holders of permits, as well as for those wishing to purchase permits. The value of permits would be reduced, all other things being equal, because there would be less certainty that they could subsequently be used. This would transfer significant risk to the holders of permits, who would find it more difficult to make decisions about long-lived investments.

Structuring permits as property rights shifts the risk of over-allocation of permits to taxpayers. Governments must therefore act with a high level of caution in allocating permits and setting future emissions caps. As discussed in Chapter 3, this is one of the main reasons why a period of 10 years has been proposed for firm caps, rather than a longer period. The use of long periods of caps with large elements of up-front permit allocation imposes risks on taxpayers in the event that caps subsequently need to be tightened.

The likely tax and accounting treatment of permits, including permits that have been allocated for free, would need to be assessed in detail before scheme commencement.

*It is proposed that permits be structured as secure property rights.*

## **7.5 Permit allocation**

Permits could be allocated in a variety of different ways. They could be sold at auction, allocated for free, or sold for a fixed price.

The way in which permits are allocated has implications for efficiency as well as for equity.

### **7.5.1 Efficiency considerations for permit allocation**

There are a number of potential pitfalls to be avoided in the way that permits are allocated. The main areas of concern relate to:

- incentive effects
- market power
- transaction costs.

#### *Incentive effects*

The way in which permits are allocated should not create perverse incentives to continue to emit, when the firm would otherwise have reduced its emissions or exited the market altogether.

There are two main ways that this might occur. The first is through the use of an ‘updating’ mechanism in the permit allocation formula, and the second is through the use of a ‘use it or lose it’ rule.

An updating mechanism is a variant on an allocation method known as ‘grandfathering’. This means that permits are allocated to a firm on the basis of some proportion of its historic emissions. An updating mechanism means that this grandfathering approach is continued during the life of the scheme, and data for ‘historic’ emissions are taken from a period in which the scheme has been in operation.

For example, if the NETS commenced in 2010, an updating mechanism could mean that the allocation of permits in, say, 2015, was related to a firm’s emissions over the period 2010–13. During the period 2010–13, a firm would take the value of permits into account when making its investment and production decisions. However, it could also take into account the value of permits that it would receive in 2015, so long as it kept up its emissions in 2010–13. In this way, the incentives of the firm are distorted. It is likely to choose to emit more than it otherwise would in the absence of the updating mechanism. Given the fact that many firms face the same incentives, an updating mechanism makes it more difficult (and expensive) to meet any particular emissions cap.

A ‘use it or lose it’ rule in relation to permits could be applied to generation plant closures. For example, say a generator had been allocated permits for the years 2010–20, but chose to shut down in 2015. If a ‘use it or lose it’ rule were in place, it would be required to give back its permits for 2016–20 to the government for free. This would reduce the firm’s incentives to reduce its output, or to shut down. If the value of permits is taken away upon closure, they cease to hold their full value during production. The generator is less likely to take the value of emissions into account when making its production decisions, or when considering the appropriate time to cease production.

Like an updating rule, a ‘use it or lose it’ rule on closure means that firms would have an incentive to emit more than they would in the absence of such a rule. This makes achieving the cap more difficult, and increases the costs of doing so.

*It is proposed that the allocation mechanisms should avoid rules that encourage firms to continue to emit, such as updating mechanisms or ‘use it or lose it’ rules for generators upon closure.*

#### *Market power*

Permits should be issued in such a way as to avoid creating market power in the market for permits, which could be used to exert market power in the market for other goods or services, such as electricity generation. If a firm were able to exert market power in relation to permits, this could artificially increase their price, and hence the cost of the scheme for the community as a whole. It could prevent new entrants from being able to access adequate permits, and it could mean that electricity prices were higher than they needed to be.

It is proposed that the allocation mechanisms should include some auctioning in order to ensure liquidity in the market. The auction mechanism should be designed in a way to ensure an efficient price signal and no exercise of market power.

Also, as discussed below, a portion of permits would be allocated to trade-exposed, intensive users of electricity. These firms would not require these permits for their own compliance and would therefore represent an additional independent source of permits for the market.

*The combination of allocations to generators, trade-exposed, energy-intensive industries and auctioning is intended to avoid market power problems in the permit market.*

### *Transaction costs*

Buying and selling permits involves transaction costs. These are incurred as firms seek out counterparties to their transactions, investigate prices, negotiate contracts, and register changes in ownership in the central registry.

The process of allocation itself can involve significant transaction costs. This is particularly the case when permits are allocated for free, according to a complex formula.

*It is proposed that the allocation mechanisms be as simple as possible, consistent with the need for them to be equitable, transparent and robust.*

## **7.5.2 Equity considerations for permit allocation**

Although efficiency issues are important, it is the equity aspect of permit allocation that involves the greatest degree of attention and is subject to the widest divergences of opinion among stakeholders.

Any allocation of permits involves a transfer of wealth. Auctioning permits could be seen as transferring wealth from liable parties and energy users to taxpayers. A free allocation of permits transfers wealth to the recipients—at the expense of taxpayers and/or energy users, if these groups would otherwise have been the recipients. A ‘fair’ allocation of permits is very much in the eye of the beholder.

The proposed permit allocation arrangements are designed to help those who are likely to be most adversely affected by the implementation of the scheme.

*It is proposed that a key objective of permit allocation is to assist those who are likely to be most adversely affected by implementation of the scheme.*

Like any major regulatory change, the introduction of binding constraints on greenhouse gas emissions would create winners and losers. Preliminary indications on the patterns of impacts were discussed in Chapter 6.

A package of assistance measures for those that are most adversely affected by the scheme is desirable.

There are three broad groups that might require help in adjusting to new emissions constraints:

- some existing electricity generators
- trade-exposed, energy-intensive industries
- other groups (which might include households, regions and small business).

The way in which permit allocation could be used as a tool to assist these groups, and why it may be a better form of assistance than other options, is set out below.

## **7.6 Permit allocation for transitional assistance**

It is proposed that permit allocation be used as the primary mechanism to provide assistance to those likely to be most adversely affected by the implementation of the scheme. It is proposed that:

- some permits be allocated for free to those existing generators likely to be adversely affected
- some permits be allocated for free to trade-exposed, energy-intensive industries
- the remainder of permits be auctioned, and the proceeds distributed among States and Territories on a basis yet to be determined, but in a manner that recognises the differing impacts of the scheme. This provides a source of revenue that could be used to assist other groups, which could include households, regions or small business.

## **7.7 Assistance to generators**

As discussed in Chapter 6, if all permits were auctioned some generators would be disadvantaged by the scheme. This is because their costs would rise for every unit of production. For the same level of production, their revenues are also likely to rise as wholesale prices increase. However, for some generators, the rise in revenues is likely to be insufficient to offset the increase in their costs (or to offset the reduction in revenue due to a reduction in output).

Black and brown coal-fired plants would be the most likely to be adversely affected. Gas-fired and renewable generators would be likely to benefit from the scheme. It should also be noted that several generating portfolios contain a mixture of likely winners and likely losers.

### **7.7.1 Free permit allocation can meet equity goals while meeting efficiency needs**

The effects on operating profits of such generators could be reduced through the provision of free permits. The more free permits granted to such firms, the smaller the negative impact on profitability. It would be possible to allocate permits in such a way as to minimise the negative effects of profitability and still have sufficient permits left over to address assistance needs for trade-exposed, energy-intensive industries and other groups.

The free allocation of permits to generators is a wealth transfer issue, rather than an efficiency issue. So long as the allocation of permits is an *ex ante* decision that is not tied to subsequent emissions levels, generators' incentives to minimise their emissions remain intact. For example, some generators might find it more profitable to sell their permits to a new entrant and close down, rather than continue to operate in the same manner as before the emissions trading scheme was introduced.

Several stakeholders expressed concerns that a free allocation of permits to emissions-intensive generators would create direct incentives for them to emit. However, this ignores the opportunity cost value inherent in freely allocated permits. A profit-maximising generator would take the opportunity cost of a permit into account in the same way as it would the cost of a permit purchased at auction. A simplified numerical example is shown in the box below.

### **7.7.2 Generators that do not require free permits**

It is proposed that new generators would not be entitled to receive a free allocation of permits. This is because a new generator could be planned, designed and constructed to operate optimally in an emissions-constrained environment. Investors in new generation plant would make their decisions with full knowledge that the emissions trading scheme would be in place, and can plan accordingly.

However, it would be important not to penalise new generators which are planned and designed before there is full knowledge of the implementation of the trading scheme. The scheme would need to incorporate a definition of a "new generator" and set a "cut-off date" accordingly.

One possible definition is that any project that would not meet the definition of a 'committed project' used by the Inter-Regional Planning Committee's criteria in the NEM as at some cut-off date would be considered as new. Under this definition, a committed project must meet all of the following criteria:

- The project proponent has acquired, or has commenced legal proceedings to acquire, land for the construction of the project.
- Contracts for the supply and construction of the project's major plant or equipment (including generators, turbines, boilers, transmission towers and conductors), including provisions for project cancellation payments, have been executed.

- The project proponent has obtained all required planning and construction approvals and licences, including completed and approved environmental impact statements (these include planning and environmental approvals from duly authorised planning bodies at both State and Federal Government levels).
- Financing arrangements for the proposal, including debt plans, have been finalised and contracts executed.
- Construction has either commenced or a firm date has been set for it to commence.<sup>82</sup>

**Stylised example of incentives facing a generator with permits allocated for free, compared with auctioned permits**

A simplified example of the incentives facing a generator under free or auctioned permits is set out in the table below. Say a generator has an emissions intensity of 1 tCO<sub>2</sub>-e/MWh. Its original marginal cost (excluding the cost of permits) was \$20/MWh. The permit price is \$20/t CO<sub>2</sub>-e, and the wholesale electricity price is \$30/MWh (with the emissions trading scheme in place). Say that the generator had been allocated 1000 free permits and was considering whether to generate an additional 1000 MWh or to not produce that output.

In this example, the generator could continue to operate and earn profits of \$10,000. However, if it shut down and sold its permits, it could earn \$20,000: the profit maximising decision is to sell the permits and to not generate that 1000 MWh.

*This incentive does not change if all permits were auctioned*—in this case, the generator would make a loss of \$10,000 if it generated the 1000 MWh, compared with making a profit of \$0 if it were not to operate over that period.

	Free allocation case	Auctioning case
Original marginal cost	\$20/MWh	
Emissions intensity	1 t CO <sub>2</sub> -e/MWh	
Price of permits	\$20/t CO <sub>2</sub> -e	
Emissions-inclusive marginal cost	\$40/MWh	
Wholesale electricity price (with NETS)	\$30/MWh	
No. of permits received for free	1000	0
Profits for 1000 MWh generation	\$10,000	–\$10,000
Profits for exit	\$20,000	0
<b>Net result from choosing to generate</b>	<b>–\$10,000</b>	<b>–\$10,000</b>
<b>Decision</b>	<b>Sell permits and do not generate</b>	<b>Don't buy permits, do not generate</b>

<sup>82</sup> NEMMCO 2005, *Statement of Opportunities for the National Electricity Market*, October, pp. 1–9



When setting the cut-off date that distinguishes between ‘existing’ (committed) and ‘new’ generators, a number of factors need to be taken into account:

- The intention is to protect the value of investments that were made in the absence of information about the scheme. There are several options for when investors could reasonably be considered to be ‘on notice’ that the scheme could be implemented.
- Earlier cut-off dates might disadvantage those who have invested considerable time and money in planning new generation capacity in an environment of genuine policy uncertainty, but have not yet passed all of the hurdles to be considered a committed plant using the definition above.
- Later cut-off dates risk creating artificial incentives to rush to commit to investments that might receive some free allocation of permits; such investments might be of a higher emissions intensity than ones that might be committed to beyond the cut-off date.

Similarly, some types of generators, particularly renewable energy generators, are likely to be better off as a result of the scheme. If the primary objective guiding permit allocation decisions is to provide assistance to those most adversely affected by the introduction of the scheme, there would be no reason to provide any free permits to such generators.

*It is proposed that no free allocations of permits be made to new entrant generators or those generators likely to be made better off as a result of the scheme, such as renewable generators.*

*Comment is sought on the definition of a new generator and on the appropriate cut-off date on which a generator is to be classed as ‘new’.*

### **7.7.3 Process for determining the allocation of permits to generators**

It is proposed that the details of the allocation plan be developed by a Scheme Developer and approved by a Ministerial Council/Forum. A Scheme Regulator would then be responsible for administering that plan (see Chapter 8). Permit allocation arrangements should be finalised before the scheme commences (i.e., before 2010).

The allocation of permits to generators that are likely to be adversely affected by the introduction of the scheme involves a process of estimation. The concept is forward-looking: what would a generator’s operating profits have been in the absence of the scheme, and what are they likely to be when the scheme is put in place?

There are many factors that affect estimates of future profits. The process of estimation is not likely to be simple. It will inevitably involve some degree of simplification and judgement. Factors influencing a generator's future levels of operating profit include:

- the level of electricity demand
- the timing, size and nature of new entrants
- the changing shape of generation portfolios, which influences their bidding incentives
- the degree of transmission constraints, particularly inter-regional constraints
- costs over time, particularly fuel costs
- when the scheme is in place, the emissions intensity of the plant
- the extent of wholesale electricity price increases
- the degree to which emissions permits are scarce, and hence their prices.

There are several sophisticated models of electricity markets in Australia that could be used to estimate the impact on generator profitability. However, all involve judgements, particularly in relation to their underlying assumptions. Projection of such assumptions over long periods of time is fraught with difficulty. Opinions on suitable assumptions are likely to vary among experts.

If such an estimation technique is used, it is considered desirable to appoint a group of experts to advise on the assumptions that should be used in the estimation process. The process for appointing such experts should take into account the views of affected parties.

The alternative to estimation of the likely impacts is to use simple, arbitrary rules to allocate permits. For example, a fixed percentage of a generator's historic average emissions could be used. The advantages of this approach are clear: it involves significantly lower transaction costs than a detailed estimation methodology. On the other hand, the degree of 'compensation' that it provides would be haphazard. It could over- or under-compensate firms for the effects of the scheme. For some generators, past emission levels are likely to be poor indicators of likely future output and profitability. It might also imply that generators that are likely to be better off once the scheme has been implemented would also receive an allocation of free permits, which means that fewer permits would be left over to assist other groups. Therefore, subject to stakeholder feedback, this option is not preferred at this stage.

*It is proposed that assistance to existing generators will seek to compensate them for estimated negative effects on profitability in relation to implementation of the emissions trading scheme.*

*It is proposed that a detailed estimation technique should be used to estimate the effects of the scheme on the future operating profits of different electricity generators. It is proposed that a once-off allocation of permits should be made before the start of the scheme, with no subsequent adjustments.*

*However, the uncertainties and transaction costs associated with this approach are likely to be significant. Comment is sought on whether this approach is desirable, or whether simpler (but more arbitrary methods) would be more appropriate.*

A further issue in permit allocation to generators is whether allocation should be based on a plant-by-plant analysis, or whether entire generation portfolios should be considered. Several existing generation portfolios contain a mixture of likely winners and losers. A plant-by-plant assessment of only those adversely affected will ignore the impact on other parts of the portfolio that benefit. In relation to the RGGI in the United States, Palmer, Burtraw and Kahn suggest that compensation be based on generation portfolios to maximise the proportion of permits left over to auction, providing revenue that could be used for compensating other groups.<sup>83</sup>

However, if compensation assessments are based on portfolios, rather than individual generators, this might create artificial incentives to restructure portfolios. One possible response is to undertake the calculations on the basis of portfolio structure at a given point in time (for example, 1 July 2006).

*Comment is sought on whether compensation for generators should be based on individual power stations or on generating portfolios.*

### *Timing issues*

The reductions in operating profits likely to be experienced by generators can be calculated in net present value terms. This requires a time frame for calculation.

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<sup>83</sup> Palmer K, Burtraw D, Kahn D 2006, *Simple Rules for Targeting CO<sub>2</sub> Allowance Allocations to Compensate Firms*, Resources for the Future Discussion Paper, June, Washington DC

It is proposed that compensation be calculated for a maximum of 20 years. (If a generator is scheduled to be closed down before this time, this would be taken into account, and less compensation would be required.)

At the time that the initial calculations are made, only 10 years of firm caps would be set, and gateways of possible caps would be set thereafter. One means of dealing with this uncertainty would be to calculate permit allocations on the basis that the mid-point of the gateways for the subsequent 10 years is chosen. This might mean that generators turn out to be under- or over-compensated for the effects of the scheme, depending on where caps are actually set in the latter 10-year period.

The aim of the process would be to award a generator (or generation portfolio) a stream of permits. This stream of permits should have the same estimated net present value as the estimated stream of reductions in operating profits. A variety of streams of different permit vintages could deliver the same net present value.

*It is proposed that the maximum period over which compensation would be calculated for generators is 20 years.*

*Comment is sought on the best way to provide long-term certainty on allocation in an environment in which firm caps are initially set for only 10 years.*

#### **7.7.4 Permit allocation versus other mechanisms to compensate generators for the effects of the scheme**

Permit allocation is not the only way in which generators could be compensated for the effects of implementation of the scheme. The main alternative measure is to provide cash assistance (which could be funded through auction revenue).

There is little difference between the allocation of cash and the allocation of permits to generators as a means of compensation. In either case, a decision needs to be made on how much assistance different generators would require. In both cases, this could be done on a detailed estimation basis, or by using more arbitrary rules.

The principal advantage of permits over cash is that the number of permits available in different years is certain, whereas auction revenues are not. It may be easier for governments to make long-term commitments in relation to permit allocation than to cash. During consultation, generators generally expressed a preference for free permits.

## **7.8 Assistance to trade-exposed, energy-intensive industries**

Whereas many countries are imposing constraints on greenhouse gas emissions, a significant part of the world economy is not currently subject to emissions constraints, and is unlikely to be so in the short to medium term. Taking action in Australia in advance of widespread international action could affect the competitiveness of Australian trade-exposed, energy-intensive industries if no mechanism were developed to prevent this. For example, the Australian Plantation Products and Paper Industry Council (A3P) stated:

For energy-intensive, import-competing sectors of the economy, such as the pulp and paper industry, any ‘carbon cost’—emissions trading, carbon tax, MRET, etc.—increases production costs. If no similar cost is imposed on competing products from countries such as China, Indonesia and Brazil, then the Australian industry will be negatively impacted in a number of ways:

- Reduced competitiveness in domestic markets;
- Reduced competitiveness in export markets;
- Increased likelihood that market opportunities from increasing demand will be met by competitors in other countries;
- Increased likelihood that internal investment decisions within a company will favour overseas production. (submission 64, pp. 3–4)

Similarly, the Australian Industry Greenhouse Network stated:

In a carbon penalty context, those industries least able to pass on the additional costs are those whose competitors are not burdened to the same extent, notably competitors in overseas countries which have not imposed (and are unlikely to impose) a comparable penalty. This highlights the problem of any ETS [emissions trading scheme] or other emissions reduction regime that is not global in coverage; and the smaller the global sub-group participating in such a scheme, the greater the competitiveness issue for the trade-exposed industries.

Trade-exposed industries include the export oriented energy-intensive industries encompassing mining and minerals processing, notably aluminium, and LNG [liquefied natural gas], and import competing energy-intensive industries including chemicals and plastics, cement, paper and petroleum refining. These industries, and their importance in the Australian economy, have built their presence on the back of Australia’s resource endowments and, in particular, the nation’s advantage as a producer of low cost energy. These Australian advantages in world trade will be dissipated if carbon emissions are significantly penalised, and Australia’s economic growth will be weaker with diminished investment in these industries.

Lower investments in these industries in Australia, however, is unlikely to dampen investment in those industries worldwide. All of them have a history of building new facilities in the most competitive locations—and for these industries, emissions costs, if comparable to energy costs, would be a key competitiveness driver.

An important characteristic for Australia, in respect of emissions intensive industries, is that our competitors, almost without exception, are countries in the developing world where the prospect of GHG emissions being imposed is very distant. (submission 47, p. 15)

At the extreme, a rise in energy prices associated with the introduction of an emissions trading scheme in Australia could mean that firms reduce their production in Australia, or close down and move offshore. Even if existing firms stay in Australia, it is possible that new investments in such industries would not be made in Australia, and would be made in other countries with no equivalent emissions constraint.

The effect on global emissions associated with firms moving offshore is uncertain. The firm could relocate to a country with a similar, higher, or lower emissions intensity of its energy supply. It could build a plant that uses energy more or less efficiently than it does in Australia. Therefore, it is impossible to draw firm conclusions about the environmental effects of relocation.

However, the economic effects of relocation are more certain—and they are likely to be negative for Australia. For this reason, it is important to address this issue.

It is difficult to gauge the effect that the scheme might have on investment and production in Australia. There are many reasons why a firm might choose to invest in Australia, rather than some other country: political stability, proximity to Asian markets, a well-trained, English-speaking workforce, and so on. For some industries, relatively cheap energy has been an important part of that decision. It is the impact on energy prices of an emissions trading scheme that should be targeted by any assistance measure.

### **7.8.1 How are trade-exposed, energy-intensive firms to be identified?**

Permits would be allocated only to firms that can demonstrate that they meet certain threshold criteria. It is proposed that permits be made available for free to firms that can demonstrate that they:

- are highly energy-intensive. (This requires the specification of some threshold, such as the proportion of operating costs or revenues accounted for by energy sources that are covered by the emissions trading scheme.) Comment is sought on the threshold level of energy intensity that should apply; and
- would experience higher energy costs as a result of the introduction of the scheme. (This would exclude, for example, firms subject to any older long-term energy contracts that do not allow any cost pass-through); and
- are subject to a high degree of international competition on export markets and/or from imports (or the threat of imports), and the prices that they receive for their goods or services are effectively set on world markets; and
- face international competition mostly from countries that impose no comparable emission constraints.

As a broad indication, the types of activities that are likely to meet the criteria of a high degree of trade exposure and energy intensity include:

- aluminium and other non-ferrous metal smelting
- steel manufacturing
- newsprint manufacturing
- some manufacturing activities in the chemicals and plastics sector.

This list is not intended to be definitive. Individual firms within these sectors may not meet these criteria. Similarly, individual firms in other sectors may meet the criteria.

*Comment is sought on the proposed criteria and, in particular, on the appropriate threshold of energy intensity for energy sources covered by the scheme (or a process to determine the appropriate threshold) to warrant assistance.*

### **7.8.2 Using permit allocation as an assistance measure**

It is possible to use permit allocation as a means of addressing the impact of the NETS on the energy prices faced by trade-exposed, energy-intensive industries. The method for doing so depends on whether the compensation is in relation to electricity used by the firm, or from fuels combusted directly by that firm, as discussed below.

#### *Indirect emissions*

Firms that are intensive users of *electricity* can be indirectly—but still materially—affected by the constraint on emissions. This is because the constraint on emissions is likely to cause electricity prices to rise (see Chapter 6).

An allocation of permits to trade-exposed, energy-intensive firms could offset the impact of an increase in electricity prices. For example, say an aluminium smelter's electricity bill was expected to rise by \$1 million a year. If that smelter received permits worth \$1 million, it would be no worse off. Trade-exposed, large energy users would realise the value of the permits by selling them to liable parties, such as electricity generators.

As for electricity generators, compensating trade-exposed, energy-intensive firms for the effects of the NETS necessarily involves some approximations and the use of modelling estimates. The main factors are:

- What is the expected increase in electricity prices in this region? Is this affected by the nature of the electricity supply contract?

- What is the firm's energy intensity of output?
- How many permits would need to be allocated to provide a monetary value equivalent to the increase in total electricity costs? This in turn depends on estimates of future permit prices.

This mechanism relies on **estimates** of future electricity prices **with** and **without** the emissions trading scheme and of the value of permits in the future. Of course, such estimates could prove incorrect. However, at least to some extent, errors are likely to cancel one another out: if impacts on electricity prices were underestimated, it is likely that so, too, were the estimates of future permit prices. This means that the value of permits that have been given to a firm is likely to rise with the need for assistance.

Several trade-exposed, energy-intensive firms have close relationships with individual generators, and the likelihood of any price increase would be related to the increase in costs experienced by that generator, rather than by the region as a whole necessarily. Where such relationships exist, they should be taken into account in the allocation process. Where allocations are made to both trade-exposed, energy-intensive firms and electricity generators that have close supply relationships with them, it is important to avoid over-compensating the group as a whole.

Chapter 6 examines the impact of the indicative scenarios modelled on trade-exposed, energy-intensive industries and estimates the proportion of permits that would need to be allocated to those industries to offset the impact of an increase in electricity prices.

### *Direct emissions*

Permit allocation can also be used to assist those trade-exposed, energy-intensive companies that would be liable parties in their own right (for example, in relation to their direct emissions from using gas or coal). This is inherently a simpler process than for large users of electricity. In the case of direct emissions, permit allocation could be tied to the estimated requirements for such permits, using baseline levels of energy intensity defined in terms of direct emissions per unit of output (see Section 7.8.3 below).

### **7.8.3 Use of energy-intensity baselines**

It is proposed that the number of permits to be allocated to an existing trade-exposed, energy-intensive firm be calculated on the basis of a baseline level of energy intensity. For example, say a firm used 13 MWh of electricity to produce 1 tonne of its product. This could be set as its energy intensity baseline. The estimated size of the increase in electricity prices could be calculated as, say, \$10/MWh. Subsequently, for every tonne of product



produced in Australia, permits would be allocated up to the amount of the estimated impact on total energy costs. In this example, the maximum number of permits allocated to the firm would be calculated as the energy intensity baseline (13 MWh/t output) multiplied by the change in electricity price (\$10/MWh) multiplied by the total tonnes of output, divided by the estimated permit price.

Energy intensity baselines could be set on a variety of bases, such as the firm's own historic energy intensity over a period of time (such as 2002–05), the Australian industry average energy intensity (where firms are making comparable products), or some measure of 'best practice' energy intensity.

For the purposes of discussion, it is proposed that for the first 10 years of the scheme benchmarks would be set on the basis of a firm's individual average emissions intensity over the period from 2002–05. Later dates for the calculation of baseline data would affect a firm's incentives to invest in energy-efficiency projects between now and 2010; this is not desirable.

After the first 10 years of the scheme, benchmarks set from 2002–2005 would be out of date, and would need to be revised. This is because most firms make small improvements in their energy efficiency over time in any event. New firm-specific benchmarks set from 2020 might reduce firms' incentives to improve their energy efficiency in the first decade. One option for updating benchmarks could be to move from being firm-specific to industry based.

If this approach were to be used, before 2020, new product-specific benchmarks could be set on the basis of Australian best practice energy intensity (that is, energy used to produce each unit of output) calculated over the years 2015–18. This new baseline would apply from 2020–29. Thereafter, baselines would continue to be updated as required on a 10-yearly basis.

Baselines for existing firms would be set by the Scheme Regulator, according to methodologies and principles proposed by the Scheme Developer and approved by the Ministerial Council/Forum. Detailed guidelines would need to address a variety of issues, including the relevant entity (site, facility or company) for which baselines should be set. These activities would need to commence well in advance of scheme commencement (see Chapter 8).

There are a number of potential data sources available for setting baselines, including information from national streamlined reporting requirements (see Chapter 9) and information gathered under the Commonwealth's Mandatory Energy Efficiency Opportunity Assessments measure.

Trade-exposed energy-intensive industries would continue to receive free allocations of permits for as long as their competitors were not subject to equivalent carbon constraints.

If the Commonwealth does not participate in the initial introduction of the scheme, but subsequently takes over its operation or commences a new scheme, new assistance arrangements would need to be negotiated with the Commonwealth—see Section 7.9 below.

*For existing plant for the first 10 years of the scheme, it is proposed that baseline levels of energy intensity be set on an individual firm basis and based on data for the years 2002–05. Calculations of the number of permits to be received by such firms would be based on subsequent output, calculated as though it was produced at the baseline energy intensity.*

*A new baseline would apply to existing firms for the second 10-years of the scheme. Comment is sought on the option of ceasing to set baselines on the basis of individual firm performance: rather, they could be based on best Australian industry practice calculated over the years 2015–18.*

*Baselines could continue to be updated at 10-yearly intervals, until competitors are subject to equivalent emissions constraints.*

#### **7.8.4 New entrants and capacity expansions**

It is proposed that new entrant trade-exposed, energy-intensive industries would also be eligible to receive a free allocation of permits. This is because the basic rationale for special treatment—that overseas competitors are not subject to equivalent constraints on emissions—is identical for new entrants and existing players. The same applies to major capacity expansions of existing plant.

However, in some respects there are significant differences between new entrants and incumbents. New entrants can decide what type of technology to install. The scheme should encourage such firms to be as efficient as possible. For this reason, it is proposed that new entrants would receive a free allocation of permits on the basis of a baseline set at best practice energy intensity using commercially viable technology.

Again, baselines would need to be set by the Scheme Regulator, according to principles and methodologies proposed by the Scheme Developer and approved by the Ministerial Council. These should take into account factors such as any agreements made with relevant State or Territory Governments prior to the commencement of the institutional arrangements, and the nature of energy supply contracts.

*It is proposed that new entrants, or major capacity expansions at existing plant, be eligible to receive free allocations of permits.*

*The baseline level of energy intensity applying to new entrants or to major capacity expansions should be set to reflect best practice energy intensity for that product, using commercially viable technology, taking into account any agreements made with relevant State or Territory Governments prior to the commencement of the institutional arrangements and the nature of energy supply contracts.*

## **7.9 How long should assistance to trade-exposed, energy-intensive industries last?**

The rationale for assistance to trade-exposed, energy-intensive industries relates to the fact that not all countries are subject to equivalent emissions constraints. Over time, it would be expected that the international scope of emissions constraints would increase, and any competitive disadvantage associated with domestic action would diminish.

However, until such time as competing nations are subject to equivalent emissions constraints, there is a case for continuing to provide assistance to trade-exposed, energy-intensive firms. Long-term, enforceable promises of permit allocations could be made on that basis. At the time when Australia's international competitors faced equivalent emissions constraints, permit allocations to trade-exposed, energy-intensive firms could be phased out; the rationale for such assistance would cease to exist. It is anticipated that the Commonwealth Government would need to be involved in any such international negotiations, and would certainly need to agree on any obligations imposed on Australia in such arrangements. If Australia were to be part of any new international regime, the Commonwealth would be required to determine transitional arrangements for Australian industries in any event.

In the event that the Commonwealth Government is not involved in the initial emissions trading scheme, but subsequently takes over its operation or introduces a new scheme, then new assistance arrangements would need to be negotiated with the Commonwealth Government.

*Permit allocation to trade-exposed, energy-intensive firms would be phased out when competing nations became subject to equivalent emissions constraints.*

*In the event that the scheme undergoes transition from being a State- and Territory-based scheme to a Commonwealth-based scheme, new arrangements would need to be negotiated with the Commonwealth Government.*

### **7.9.1 Will allocating free permits to trade-exposed, energy-intensive firms affect the environmental effectiveness of the cap?**

Providing permits to trade-exposed, energy-intensive firms is not incompatible with achieving environmental objectives. So long as the cap is unaffected, the environmental outcomes should be the same.

However, allocation to trade-exposed, energy-intensive firms that is tied directly to **energy use** could affect the **cost** of meeting the cap. This is because firms receiving a tied allocation of permits would have poor incentives to reduce energy use in response to the emissions price signal. Therefore, tying allocation directly to ongoing energy use is not proposed.

Despite the offsetting allocation of permits, firms would still face the full emissions-inclusive energy cost and would therefore still have an incentive to seek out profitable energy-efficiency projects.

Of course, if no assistance were provided, it is possible that Australian production in those industries would decline. This would make it easier to meet any domestic emissions cap, but, as noted above, at the cost of economic activity in Australia, with uncertain implications for global emissions (since production would simply occur elsewhere).

## **7.10 Treatment of closing firms**

If firms are to receive allocations of free permits, a decision needs to be made as to what happens to those permits if a firm subsequently shuts down.

It is proposed that electricity generators and trade-exposed, energy-intensive firms be treated differently in this regard.

### **7.10.1 Treatment of electricity generators that close down**

If an electricity generator has been allocated permits in advance (or has been promised an allocation of those permits in some future year), what should happen to those permits if the firm subsequently closes down?

There are two options: require the electricity generator to return the permits to the government(s) that issued them, or allow the electricity generator to keep them.

As noted in Section 7.5.1 above, ‘use it or lose it’ rules create poor incentives. If the electricity generator is required to return permits if it shuts down, then it faces different incentives than if it is allowed to keep them.

If the permits are required to be returned, then this means that there is no opportunity cost associated with using those permits. This means that the price signal on emissions that the scheme is designed to create is obliterated for firms that are considering shutting down.

Older and more emissions-intensive plants are the most likely to consider whether shutting down and selling permits would be more profitable than continued operation. Anecdotal evidence suggests that in the UK the rule that closing firms must return free permits, combined with a ‘wait and see’ incentive created by uncertain future allocation rules, is inducing old coal-fired plant—which even in a business as usual case would probably have shut down by now—to keep producing electricity.

*It is proposed that electricity generators that close down should not be required to return any free allocations of permits to the governments that issued them. This is to avoid perverse incentives to continue to emit when it would not otherwise be profitable to do so.*

### **7.10.2 Treatment of trade-exposed, energy-intensive firms that shut down**

For trade-exposed energy-intensive firms, however, a different set of considerations applies. This is because the objective of permit allocation is to mitigate the effects of the scheme on energy prices, in order to neutralise any incentives to move offshore created solely by the costs of reducing emissions through the scheme. If a generator shuts down, it will be replaced by a new generator in Australia. If a trade-exposed, energy-intensive firm shuts down, its output may simply be replaced with output from another country. A completely untied allocation of permits to trade-exposed large energy users could possibly **increase** the likelihood of those firms exiting Australia and producing elsewhere. This is clearly undesirable from an economic development point of view. (As discussed above, the environmental consequences in terms of global emissions are uncertain.)

An unfettered allocation of permits to trade-exposed, energy-intensive firms could increase the chances of a firm moving offshore, because those permits are a source of value to that firm. If the firm uses such an allocation to offset increased energy costs in Australia, then its profits would be around the same as they were previously (depending on the number of permits granted compared with the increase in energy costs). If the firm were to exit Australia, however, it could earn profits from operating elsewhere **and** earn the revenue from the sale of permits. Depending on the level of profitability of operating in a different country and the value of permits, this could encourage firms to leave.

A simplified numerical example is provided in the box below.

Therefore, so long as the value of free permits is greater than the reduction in profits associated with moving, a firm would have an incentive to move.

**Permit allocation to trade-exposed, energy-intensive industries and incentives to move offshore**

The numbers in this numerical example are not meant to be in any way representative of the actual impacts of the scheme.

Say the net present value of a firm's operating profits in Australia in the absence of the scheme is \$100 million. If the scheme were introduced, energy costs rise by, say, \$20 million (net present value). To offset this effect, the firm is given permits worth \$20 million. If the firm continues to operate in Australia, its profits would remain at \$100 million.

Say the firm's next best option for production is in China. Taking into account exit costs from leaving Australia and all of the establishment and ongoing costs associated with operating in China, the firm would expect to earn \$90 million (net present value) operating in that country. In the absence of the scheme, the firm would clearly choose to operate in Australia. However, its incentive changes if it is allocated free permits with no strings attached. If the firm were to sell its permits and move to China, then its profits would equal \$90 million plus the \$20 million from selling its Australian permits. It would therefore earn \$110 million—and would move.

If the firm moves, this clearly makes it easier for the rest of the Australian community to achieve its emissions cap. Less energy would be consumed, and so the community could operate at a lower level on the domestic abatement supply curve.

However, from a global perspective emissions might not have been reduced. Additionally, Australia would be worse off from an economic development perspective.

*It is proposed that any free allocation of permits to trade-exposed, energy-intensive firms should not be made in advance in a completely unfettered manner.*

If permit allocations are not to be made in a completely unfettered manner, then what should they be tied to? As discussed above, tying permit allocation directly to energy use is likely to create perverse incentives to use more energy and avoid energy-efficiency measures. Therefore, this is considered unsuitable.

If permit allocation is not tied directly to energy use, then the next logical candidate is output. This could be achieved in various ways:

- By the recall of up-front allocations if the firm reduces its output below a certain level. However, for indirect emitters who are not liable parties in their own right, the permits are already likely to have been sold to a direct emitter. It could be a requirement that the firm would have to pay back the value of those permits if it

were to reduce its output below a certain threshold. A value of the permits would need to be agreed on; this is potentially difficult if the market proves to be dominated by bilateral trades where the market price is not particularly transparent.

- By allocating permits in 1-year batches, or in arrears. For example, every year, permits could be allocated according to the benchmark multiplied by the output of the previous year. If production has fallen, the number of permits allocated would be reduced in the next year. This does not prevent long-term promises on permit allocation being made; however, it is proposed that those promises be related to ongoing output.

*It is proposed that allocations to trade-exposed, energy-intensive firms be linked to output levels in each year. Long-term enforceable promises on permit allocation would be made, but actual allocation of permits would take place annually (according to the terms of the up-front agreement).*

### **7.10.3 Permit allocation compared with alternative measures to assist trade-exposed, energy-intensive industries**

Permit allocation is not the only mechanism that could be used to assist trade-exposed, energy-intensive users. The main alternatives are:

- cash
- exemptions.

If the Commonwealth accepts the invitation from State and Territory Governments to be involved in the introduction of the scheme, then some additional measures could be considered. These include the use of border tax adjustments (adjustments to the prices of imports or exports) or adjustments to corporate taxes.

An assessment of permit allocation compared with cash or exemptions is provided below.

#### *Direct emissions*

For large energy users that have combustion emissions in their own right (for example, from the use of gas or coal), free allocation provides a simple and effective mechanism for compensating for the effects of the scheme, while still providing a clear incentive for a firm to improve its energy efficiency. (As discussed above, so long as allocation is not tied directly to ongoing energy use, incentives to conserve energy will be maintained.)

By contrast, an exemption removes any emissions price signal from energy use. All other things being equal, a firm is likely to use more energy under an exemption than it would under a free allocation approach, because the latter creates an incentive to conserve energy and sell ‘spare’ permits. Since firms would be likely to use more energy under an exemption approach, this would make it harder (and more expensive) for the rest of the economy to achieve a particular emissions cap.

An allocation of cash is in many ways similar to an allocation of free permits. However, for direct emissions at least, the provision of free permits is more straightforward than the provision of cash. This is because trade-exposed, energy-intensive firms with direct emissions will be liable parties in their own right, and would presumably use the cash to purchase permits. A direct allocation of permits is likely to reduce transaction costs overall.

Several affected stakeholders indicated during consultation that they would prefer free permits to an allocation of cash.

#### *Indirect emissions*

For electricity users, exemptions would be significantly more difficult to administer than permit allocation—it is difficult to exempt a party that is not a liable party in the first place.

For those electricity users with a very close relationship with a particular generator, exempting the generator for that part of its load associated with supplying the large user might be possible. For example, say a smelter had a financial hedge with a coal-fired plant to take electricity for a 20-year period at that generator’s average cost of production. If the generator were liable for its emissions, it would not be able to maintain this contract price: its costs would constantly exceed its revenues. Exempting the generator would mean that permit prices (and subsequent pool prices) would become irrelevant—it could continue to provide electricity under a financial contract with the smelter at its long-run average cost of production. (Of course, an independent generator would prefer the best of all worlds—an exemption from liability and a higher contract price that assumes no exemption. For this reason, this option would probably be suitable only for especially close, long-term relationships.)

The differences between exemptions and free permit allocation as a transitional mechanism for trade-exposed, energy-intensive firms include:

- Trade-exposed, energy-intensive firms would be more perfectly insulated from the effects of the scheme under the exemption approach than the free allocation approach. This is because the exemption approach does not rely on estimates of future permit and pool prices. However, free permit allocation could also be a highly effective form of assistance.



- It is difficult to scale an exemption. For example, it is difficult to tie it to any benchmark of energy efficiency over time. It is an ‘all or nothing’ approach.
- The emissions price signal is not faced by the generator, and so it will not affect the generator’s subsequent output and maintenance decisions. This creates a distortion that would be likely to make the overall emissions cap more difficult to meet than if that generator were not exempt. This problem does not exist under the free permit allocation model.
- Trade-exposed, energy-intensive firms would not face any additional price signal to improve their energy efficiency. Free permit allocation preserves the price signal created by the scheme.

Since exemptions remove incentives for both generators and trade-exposed, energy-intensive firms to improve their emissions intensity and energy intensity over time, exemptions are likely to be a more socially costly method of providing adjustment assistance than a free allocation of permits.

For indirect emissions, the provision of cash is quite similar to the provision of free permits. This is because the firm would be expected to sell the free permits, thereby raising funds to offset the increase in electricity costs. However, during consultation several affected stakeholders indicated that they preferred an allocation of free permits ahead of an allocation of cash (so long as the allocation was a long-term measure).

Permits have an advantage over cash in that their value automatically expands or contracts in line (roughly) with increases or decreases in electricity prices.

An additional advantage of permits over cash is that the number of permits available in different years is certain, whereas auction revenues are not. It may be easier for governments to make long-term commitments in relation to permit allocation than to cash.

## **7.11 Assistance to other groups**

It is proposed that remaining permits (that is, those that are not provided to generators or trade-exposed, energy-intensive industries) be auctioned, and that this revenue be returned to States and Territories on a basis yet to be determined, but in a manner that recognises the differing impacts of the scheme. This provides a source of revenue that could be used to offset the impacts of the scheme on other groups, which could include households, regions and small business. Stakeholder views are sought on how this revenue could best be distributed and/or used to offset adverse impacts.

There does not appear to be any compelling reason why State and Territory Governments need to adopt **identical** approaches towards providing transitional assistance for other groups, particularly small energy customers such as households. There are several reasons why this is the case.

First, unlike generators or trade-exposed, energy-intensive firms it is unlikely that any locational decisions would be distorted by different approaches. A household or a small business for which energy costs represent only a small proportion of total costs is highly unlikely to move to a different State or Territory simply because of a different approach to energy concessions or energy-efficiency promotion.

Second, State and Territory Governments have a range of slightly different policies already in place in relation to energy bill concessions, energy-efficiency promotion and retail tariffs generally. Each State and Territory might prefer to adopt measures that harmonise with its existing approaches. As noted above, this could make the provision of such assistance administratively simpler.

Third, there might be differences of views among State and Territory Governments on who should receive assistance, or in relation to the extent of that assistance. Even if all State and Territory Governments attempt to target low-income households for the purposes of financial assistance, it is possible that they might define low-income households in different ways, or choose to assist them in different ways.

Finally, an institutional structure already exists to develop a national approach to promoting energy-efficiency measures, including among small energy users. The National Framework for Energy Efficiency (NLEE) comprises representatives from all jurisdictions (including the Commonwealth). To the extent that national approaches to energy-efficiency promotion are required, there is already a forum for pursuing that goal.

*It is proposed that the remainder of permits that are not allocated to generators or trade-exposed, energy-intensive industries would be auctioned. Auction revenue would be divided among jurisdictions on a basis yet to be determined, but in a manner that recognises the differing impacts of the scheme. This revenue could be used to assist other groups, such as households, regions or small businesses.*

*Stakeholder views are sought on how this revenue could best be distributed and/or used to offset adverse impacts.*

## **7.12 Summary of allocation proposals**

It is proposed that each permit should give the holder the right to emit 1 tonne of CO<sub>2</sub>-e. Each permit would be 'date-stamped' with the year in which it first becomes valid (its vintage).

The way in which permits are to be allocated is designed to ameliorate the effects on those who are likely to be most adversely affected by the implementation of the scheme.

In summary, it is proposed that permits be allocated in three broad tranches:

- Some permits would be allocated for free to those generators estimated to be adversely affected by the scheme. A process needs to be developed whereby impacts on generators are assessed. A one-off, allocation of permits would be made to 2030. No free allocation of permits would be made to new generators or to those that are likely to be better off under the scheme.
- Some permits would be allocated for free to firms in trade-exposed, energy-intensive industries (both existing and new). The purpose of this allocation is to offset the impact of the emissions trading scheme on energy prices, and thereby neutralise the effect of the scheme on international competitiveness. Again, this requires a process to be developed to estimate the impact on energy prices that the scheme might bring about. For existing firms, for the first 10 years of the scheme permit allocation would be based on a baseline level of energy intensity that would be specific to the firm. For the subsequent 10 years of the scheme, the baseline would be set in relation to an Australian existing best practice benchmark. For new entrants, the baseline would be set on a best practice benchmark using commercially viable technology. Permit allocation would cease in the event that a firm were to close down its Australian production or competitors were subject to equivalent emissions constraints.
- The remainder of permits would be auctioned. Auction revenue would be divided among the States and Territories on a basis yet to be determined, but in a manner that recognises the differing impacts of the scheme. This revenue could be used to fund assistance measures for other groups, such as households, regions or small business.

## **8 Institutional arrangements**

*This Chapter sets out broad proposals for institutional arrangements for the governance structure of the NETS. If the Commonwealth chooses to implement the scheme in conjunction with the State and Territory Governments, then it is possible that existing institutions could undertake these roles. In the absence of Commonwealth involvement, the State and Territory Governments would need to establish new institutions. The Chapter does not attempt to set out the minutiae of scheme institutional arrangements; such details will be progressively developed by governments as the scheme's design is progressed.*

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### **8.1 Institutions required to implement emissions trading**

New governance arrangements will be required to implement a NETS and support its ongoing operation and administration, its registry system, and its reporting, compliance monitoring and enforcement regime.

In designing the NETS, the clear preference of all State and Territory Governments and stakeholders is for the Commonwealth Government to be involved. Therefore, the preferred options in this Chapter are based on Commonwealth Government participation and the use of existing institutional arrangements. These institutions could be, for example, those created for energy market governance in Australia (that is, the Ministerial Council on Energy, the Australian Energy Market Commission, and the Australian Energy Regulator). However, other options may also be possible (for example, the National Environment Protection Council and other policy and regulatory agencies).

In the event that the Commonwealth Government chooses not to participate in the NETS, State and Territory Governments could establish a new, separate Ministerial Forum, Scheme Developer and Scheme Regulator to govern the scheme. Although there are clear advantages to Commonwealth involvement, operation of a scheme remains feasible without Commonwealth involvement at commencement.

### **8.2 Intergovernmental agreement**

To work effectively, the NETS would require a consistent legislative framework and approach to implementation across jurisdictions. Stakeholders were unanimous in their view that scheme rules, institutions and implementation should be nationally consistent.

An intergovernmental agreement is seen as the best way to progress this. In broad terms, the intergovernmental agreement would need to cover issues such as:

- the legislative structure to give effect to a NETS and the obligations of liable parties
- the roles, responsibilities and governance arrangements for new institutions created under the agreement

- arrangements for Ministerial oversight
- funding and other financial arrangements, such as agreement on how auction revenues are distributed
- review provisions.

Intergovernmental agreements of this type are common in Australia where cross-jurisdictional arrangements are to be put in place. Well-known examples are the intergovernmental agreements on the environment, on national competition policy arrangements, and on the management of the Murray-Darling Basin.

### **8.3 Legislation**

Legislation would be required to establish the basic framework of the scheme. For example, legislation would need to cover issues such as:

- emissions monitoring, reporting and verification
- establishing an obligation to surrender permits or offset credits in respect of greenhouse gas emissions
- setting out the functions and powers of relevant institutions
- the ability to impose penalties for non-compliance on liable parties
- the ability to impose penalties for non-compliance with conditions of accreditation for offset creators.

With Commonwealth Government participation in the scheme, primary legislation could be enacted by the Commonwealth Government, with complementary legislation and/or a referral of powers by the State and Territory Governments if needed. In the absence of Commonwealth participation, the State and Territory Governments would still be able to implement nationally consistent legislation based on the approaches used in previous areas of joint effort<sup>84</sup> that have not involved the Commonwealth.

Beyond the initial establishing legislation, the scheme would need regulations and rules to deal with matters of finer detail. These regulations and rules would be developed through extensive consultation.

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<sup>84</sup> For example, the *Uniform Consumer Credit Code*, Mutual Recognition Legislation, and the *National Electricity Law*.

### **8.3.1 Option 1: Commonwealth legislation with complementary legislation by State and Territory Governments as needed**

The preferred approach is for the Commonwealth to enact legislation to create the scheme on a basis agreed with the State and Territory Governments, with complementary legislation passed by the State and Territory Governments as required.<sup>85</sup> The advantages of this approach include:

- the legislative change process would be simplified.
- Policy, regulatory and administrative functions may be able to be conferred on an existing policy agency and regulator.

### **8.3.2 Option 2: Template legislation passed in one State, with other States legislating the application of the template and future changes to that template**

If the Commonwealth did not choose to participate in the implementation of the scheme, a viable alternative option would be for one State to pass template legislation, with other State and Territory Governments applying that template legislation through their own Acts of Parliament. This is the normal approach taken by the State and Territory Governments for issues in which the Commonwealth is not involved. The advantages of this approach include:

- It is a relatively straightforward way to obtain consistent nationwide legislation without the involvement of the Commonwealth.
- Because any changes to the template legislation would need to be approved by the legislation's governing body (which presumably would include representatives of the other jurisdictions), the scope for 'individualising' the legislation is reduced.
- national institutions could be created with powers conferred by each State and Territory.

The disadvantages of this approach include:

- The scope for Parliamentary oversight of the legislation may be limited, although this could be avoided by obtaining agreement in principle prior to the template legislation being passed in the 'home' state.

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<sup>85</sup> Other models involving the Commonwealth are possible. For example, South Australia remains the lead legislator for the NEM, with the Commonwealth having adopted the South Australian law.

- A State or Territory could repeal or vary the legislation applying the template legislation at any time, potentially undermining the national application of the scheme. (However, in the presence of an intergovernmental agreement, this would be unlikely.)

*The preferred option is for the Commonwealth Government to pass legislation to enact the scheme, with complementary legislation passed by State and Territory Governments as required. An alternative approach, if the Commonwealth chooses not to participate in the scheme, is for one State to pass template legislation which would then be legislatively adopted by the other State and Territory Governments.*

## **8.4 Institutional arrangements**

This section describes the institutions needed to govern and administer the scheme. Stakeholders who commented on institutional arrangements generally identified the need for a Scheme Regulator and registry. Some stakeholders emphasised the need to separate regulatory and policy functions. For example, the Australian Financial Markets Association drew attention to:

... the experience of developing a National Electricity Market out of what was essentially a set of State based electricity sectors. Despite various difficulties, overall the NEM development institutions have proved functional, and present a working model.

In particular, the importance of separating roles of implementation/operation from the roles of oversight/rule changes, and the roles of the States in the regulatory arrangements are worth closely examining. (submission 51, p.11)

A smaller number commented on the need for overarching governance arrangements. Hydro Tasmania wrote:

The key institutions required to administer a NETS [include] a governance body, made up of jurisdictional representatives, with responsibility for establishment of the Scheme rules and future enhancements. (submission 31, p.5)

Stakeholders also suggested a need for scheme performance reporting and auditing, dispute resolution, and administration of appeals.

The institutions proposed for the national scheme are described below.

#### **8.4.1 Ministerial oversight by Ministerial Council or Forum**

Given the initial focus of the scheme on stationary energy, the preferred approach would be to have an existing Ministerial Council, such as the Ministerial Council on Energy, provide appropriate Ministerial oversight. The Ministerial Council would oversee the implementation and ongoing administration of the NETS, providing for national consistency and an efficient and effective scheme.

The Ministerial Council would have responsibility for:

- the policy framework for a NETS, including decisions on setting the cap and future gateways, scheme coverage and any future expansions, approval of permit allocation methodology, eligible offset projects and management of transitional arrangements
- policy oversight and future strategic directions for a NETS (including possible linking to other international schemes)
- governance and institutional arrangements for a NETS, including oversight of regulatory and policy bodies
- the legislative and regulatory framework within which the NETS operated, and agreement on any changes to that framework.

An alternative approach, in the absence of Commonwealth participation, is for State and Territory Governments to establish a Ministerial Forum on Emissions Trading. The Ministerial Forum would have representation from all State and Territory Governments and would fulfil the role that would otherwise have been carried out by a Ministerial Council that involved the Commonwealth.

In such a case, each State and Territory would nominate a Minister as its principal Member of the Ministerial Forum. A number of issues, such as who would chair the Council, voting rights and decision-making processes, would need to be addressed. Any amendments to the intergovernmental agreement on emissions trading, legislation or regulations could be decided on by unanimous agreement of all parties. Any administrative matters could be decided by a majority of members.

The Ministerial Council or Forum may have to be established quite soon after the scheme is legislated, in order to deal with issues arising during the transition period prior to the possible commencement of the scheme (i.e., 2007-2009).

<i>It is proposed that a Ministerial Council (for example, the Ministerial Council on Energy) or Ministerial Forum oversee the NETS.</i>
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#### **8.4.2 Scheme Developer**

The Ministerial Council would be required to make decisions on the ongoing development of the scheme. Advice on such developments could be provided by the Australian Public Service (if the Commonwealth were participating in the Scheme) and State and Territory public services. However, a number of policy functions need strong coordination. It may be desirable to assign scheme development functions to a separate body, perhaps one currently tasked with supporting the Ministerial Council, such as the Australian Energy Market Commission.

The functions of the Scheme Developer would include:

- permit allocation:
  - devising a permit allocation methodology for approval by the Ministerial Council/Forum. This is an ongoing function, particularly in relation to permit allocations for new entrant trade-exposed, energy-intensive industries and for auctioning.
  - designing (but not carrying out) permit auctions,<sup>86</sup> in conjunction with the Regulator.
- scheme scope:
  - conducting reviews at the request of the Ministerial Council/Forum and identifying priority areas for expansion (for example, alterations to thresholds or the inclusion of a broader range of sectors and emissions)
  - giving guidance and detailed interpretations of the rules for liability; for example, the definitions of liable parties (installations, sites, companies and application of the aggregation rule) and thresholds, which may need further interpretation.
- caps:
  - conducting reviews and making recommendations on future caps and gateways. For example, the Ministerial Council/Forum would need advice on the implications of different caps within the adopted gateways before it could extend the period over which firm caps apply.
- performance monitoring and reviews:
  - being responsible for ongoing assessment of the performance of the scheme (see Section 8.5), and for making recommendations (and conducting public consultation processes) for scheme amendments over time.

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<sup>86</sup> Auction design is of great importance to the realisation of the objectives of auctioning permits. There will be consultations and experimental testing on the final auction design in order to ensure that the auction regime is transparent and reliable, supporting early and robust price signals and reducing the potential for market power or collusion.

These roles are similar in many respects to the role that the Australian Energy Market Commission plays in supporting the Ministerial Council on Energy. The Australian Energy Market Commission is responsible for rule making and market development.

Previously, in the NEM the lines between regulation and policy advice were blurred. The roles of the National Electricity Code Administrator included enforcement, rule making and market development. This proved to be an unsatisfactory approach. The current arrangements have much clearer lines of accountability between the Ministerial Council, the body supporting that Council, and the regulator (the Australian Energy Regulator).

Should the Commonwealth Government choose not to participate in the NETS, the State and Territory Governments could establish a separate scheme development agency to support a Ministerial Forum.

*It is proposed that a central body be given responsibility for advising on a range of ongoing policy issues before the implementation of the scheme and during the scheme's operation. If the Commonwealth is involved in the implementation of the scheme, then an existing body (such as the Australian Energy Market Commission) could be tasked with that role.*

*If the Commonwealth chooses not to participate in the scheme, the State and Territory Governments could establish a small scheme development agency to support the Ministerial Forum.*

### **8.4.3 Scheme Regulator**

A single national regulator should be established to manage the implementation and running of the scheme. Preferably this role should be assigned to an existing body such as the Australian Energy Regulator. The Scheme Regulator could take on the following functions:

- establishing and maintaining a registry. This may include:
  - creating a registry (the development, operation and maintenance of which could be contracted out)<sup>87</sup>
  - issuance of permits according to the methodology approved by the Ministerial Council/Forum

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<sup>87</sup> There are currently three greenhouse-related registries operating in Australia, for MRET, GGAS and the Queensland 13% Gas Scheme. The experience of developing and operating these, as well as international standards and other established registry systems, will be taken into account when designing and developing the emissions trading scheme registry. This is likely to lower the costs of registry development considerably.

- issuance of credits for verified emission reductions created by offsets
- recording ownership changes associated with all permit transactions, including acquittal and cancellation of permits
- reflecting the holding of CDM credits in other registries that will be used for compliance in Australia
- allocation of permits under the scheme, including the running of auctions and distribution of auction revenue among jurisdictions
- registration of offset projects according to eligible project types and baseline methodologies agreed by the Ministerial Council/Forum
- accreditation of auditors to (a) verify the monitoring reports of liable entities, and (b) verify the emissions reductions achieved by offset projects
- spot checking the verified monitoring systems and monitoring reports in order to oversee the work of auditors
- compilation of verified monitoring reports in order to assess compliance
- enforcement of compliance obligations under the scheme, including issuing of penalties and publicly naming entities who do not comply with permit acquittal requirements.

Should the Commonwealth Government choose not to participate in the NETS, the State and Territory Governments could establish a separate regulator.

#### **8.4.4 Market participants to establish other market devices**

It is not proposed that a trading platform should be established by governments. The role of governments in setting institutional arrangements is to facilitate the development of an efficient and effective scheme. Governments are best able to achieve this by establishing and protecting property rights, establishing a robust registry system, and generally preventing the development of impediments to markets.

The role of governments does not extend to the formation of market devices, acting as a broker, or developing trading platforms. Formation of market devices is best left to markets. The experience of the EU ETS shows that trading platforms can be created without government intervention, so long as there is sufficient demand for their services.<sup>88</sup>

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<sup>88</sup> However, monitoring of scheme performance and regular reviews by the Scheme Developer would include assessing the operation of the market.

*A single national regulator would be required. If the Commonwealth is involved, it is proposed that these functions be undertaken by an existing body, such as the Australian Energy Regulator.*

*If the Commonwealth chooses not to be involved in the implementation of the scheme, it is proposed that a new body be established by the State and Territory Governments.*

*It is proposed that governments leave the establishment of trading platforms and other market devices to the market.*

## **8.5 Reviews**

A number of reviews are nominated in respect of the scheme:

- scheme coverage (Chapter 2 and Section 8.4.2)
- levels of future caps and gateways (Chapter 3 and Section 8.4.2)
- penalties and possible future use of a make-good provision (Section 4.3.2)
- assistance for energy-intensive, trade-exposed firms in the face of major new international developments (Section 7.8)
- emissions intensity baselines for energy-intensive, trade-exposed firms from 2020-2029.

It is proposed that a general review of the scheme's rules be undertaken by the Scheme Developer and reported to the Ministerial Council/Forum 5 years after the commencement of the scheme (potentially in 2015 if the scheme commences in 2010). The review will cover the matters set out above, along with other matters as considered necessary by the Ministerial Council/Forum. The subject of the review would be confined to the detail of the scheme's rules, operation of institutions and the market, and related provisions, in order to maintain and enhance the scheme's effectiveness and efficiency. The review would be based on an assumption of scheme continuation and would not consider the question of the scheme's continuing operation.

The scope of the review would be set so as to avoid a type of problem that arose in relation to the review of the MRET scheme in 2003. The scope of the MRET review was sufficiently broad that observers could not be certain of the scheme's continuation. This led to a level of uncertainty that created a significant disincentive to new investment.

*It is proposed that a general review of the scheme's rules, operation of institutions and functioning be finalised by 5 years after the commencement of the scheme with the objective of maintaining and enhancing scheme effectiveness and efficiency. The scope of the review would be developed so as to maintain investor confidence in the scheme.*

## **8.6 Stakeholder involvement**

Many of the functions described above, such as cap and target setting and scheme reviews, are likely to be of interest to stakeholders. It is likely that the Ministerial Council/Forum and Scheme Developer would actively seek stakeholder input to major questions of scheme design. However, there may also be a role for stakeholder input in day-to-day administration of the scheme by the Scheme Regulator. The Centre for Energy and Environmental Markets wrote:

...there is a need for separate institutions in each of the following areas:

- scheme development and design,
- scheme implementation and administration, and
- scheme review and evaluation

A formal and transparent stakeholder process for each of these institutions is important to their success. The linkages and information flows between these institutions also need to be formal and transparent as much as possible. (submission 59, p. 13)

Stakeholders' views are sought on possible mechanisms and processes by which stakeholders could participate in proposed scheme administration and policy development, such as in reviews of the scheme and setting of further caps and gateways.

<p><i>Comment is sought on possible mechanisms and processes by which stakeholders could participate in scheme administration and policy development.</i></p>
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## **8.7 Conclusion**

This Chapter identifies at a high level the institutions and governance functions required for a NETS to operate. This Discussion Paper does not attempt to address the significant detail that would eventually be required to establish such institutional and governance arrangements. Governments would progressively flesh out those details as the scheme's architecture was further developed.

The NETS would require an intergovernmental agreement setting out how the scheme is to be established, governed, and implemented consistently across jurisdictions.

A Ministerial Council or Forum, a Scheme Developer and a Scheme Regulator would be established in accordance with the intergovernmental agreement and legislation to give effect to the scheme. The Ministerial Council/Forum would provide the final decision-making forum, along with scheme oversight and accountability for the scheme's operations. The Scheme Developer would provide support to the Ministerial Council/Forum to ensure that the scheme's parameters and framework remain efficient, effective and appropriate to the scheme's objectives. The Scheme Regulator would be responsible for the day-to-day operation of the scheme.

Governments would thereby provide the governance institutions, rules and frameworks that would allow market participants to establish other market institutions and devices as required (such as trading platforms). Governments would not act in the market to establish such devices.

The Ministerial Council/Forum and Scheme Developer would undertake reviews of particular aspects of the scheme (such as coverage and banking provisions) and would perform a general review of the scheme rules 5 years after the commencement of the scheme and periodically thereafter. The terms and scope of the reviews would be devised with a view to maintaining investor confidence and market efficiency.

## 9 Emissions monitoring, reporting & verification

*This Chapter describes the high-level requirements for mandatory emissions monitoring, reporting and verification under a possible NETS. Mandatory reporting in covered sectors would be required at least two years in advance of the scheme commencing. All Governments recognise the need to streamline the current array of greenhouse and energy reporting requirements. The Council of Australian Governments (COAG) aims to reach agreement on national purpose-built legislation by December 2006 for cost-effective mandatory reporting and disclosure at the company level.*

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### 9.1 Monitoring, reporting and verification requirements for emissions trading

An effective, credible and efficient emissions monitoring, reporting and verification system would be required to underpin the NETS.

The data requirements within the covered sectors for emissions trading may actually be simpler than those applying under many current programs. However, the quality and integrity of the system requirements would be much higher than in some existing schemes (particularly voluntary schemes), and there would be requirements to establish and verify monitoring systems and emission reports.

The principles guiding monitoring, reporting and verification are accuracy, completeness, consistency, transparency and timeliness.

Essential requirements for emissions monitoring, reporting and verification under an emissions trading scheme include:

#### Monitoring requirements

- mandatory monitoring by liable parties
- verified monitoring systems
- protocols for accurate emissions calculation, including protocols for calculating imputed emissions<sup>89</sup>
- national and international consistency
- appropriate penalties for non-compliance with monitoring requirements (including for providing false, misleading or late information).

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<sup>89</sup> To enable gas retailers to calculate the emissions arising from the gas that is used by their customers.

**Reporting requirements:**

- mandatory reporting above specified thresholds by liable parties, based on standardised reporting formats
- appropriate penalties for non-compliance with reporting requirements
- public disclosure of emissions data at an appropriate level.

**Verification requirements:**

- mandatory verification of monitoring systems and reports by accredited auditors
- verification procedures, including auditor accreditation processes
- appropriate penalties for obstructing auditors
- sanctions against auditors who breach their obligations.

Desirable elements of an emissions monitoring, reporting and verification system include:

- cost-effective, standardised reporting formats and methodologies
- protocols built on the established body of work in Australia and internationally (for example, NGGI, IPCC, ISO 14064 and ISO 14065), adapted to Australian conditions and to Australian NETS design, including sectoral coverage and point of liability for monitoring and reporting
- use of Australian standards for uncertainty estimation, and development of Australian standards for estimation of facility- or source-specific emission factors.

Liable parties would need to monitor emissions and have emissions verified at a disaggregated level, to give accurate information on the emissions by covered facilities. A separate calculation should be made for each installation and for each fuel or greenhouse gas. For most industries this would be at a facility level to ensure the appropriate verification of the data. Public disclosure of the data might be by facility or at a more aggregated level, such as at company level.

Many respondents to the Background Paper agreed that reporting needed to be mandatory, accurate, timely and robust. Many stakeholders indicated a preference for use of existing reporting frameworks, primarily to minimise the reporting burden. However, if either this or cross-jurisdictional harmonisation were not possible, stakeholders were of the view that introduction of a new reporting system should be carried out in conjunction with the streamlining of existing reporting requirements.



Respondents varied in their views of the appropriate level at which reporting should occur. The Centre for Energy and Environmental Markets considered that:

Reporting should be based on the facility level since merger and acquisitions are likely to occur and data can be more easily managed. Furthermore, data verification is more easily performed at a facility level rather than company level. (submission 59, p. 19)

Some submissions suggested that a high level of transparency would be required. WWF, for example, wrote:

Reporting must be on an annual basis, must be included in formal Annual Reports and must be publicly accessible on the internet. Late reporting must be subject to penalties. (submission 41, p. 7)

A number of the issues raised by stakeholders are likely to be addressed under the national processes described in Section 9.3, particularly in relation to streamlining and harmonisation of reporting requirements.

## **9.2 Coverage and timing of monitoring, reporting and verification**

If the scheme were to start on 1 January 2010, it is proposed that emissions monitoring, reporting and verification commence at least 2 years before the start of the scheme—that is, no later than 1 January 2008—for liable parties. If it is decided to include new sectors after the commencement of the scheme, then monitoring, reporting and verification requirements should apply at least two years before their inclusion as liable parties. This would provide sufficient time to develop, implement and refine monitoring and reporting systems and protocols, and to establish an audit program.

The introduction of monitoring before commencement of liability requirements was supported in the few submissions on the Background Paper that expressed views on timing. Santos wrote:

A scheme should be introduced as soon as possible but should allow for reasonable transition time to enable participants to put in place the necessary measurement and reporting systems. We envisage start-up before the end of the decade coinciding with the requirement for new (gas fired) base-load electricity generation in Eastern Australia. (submission 36, p. 2)

TRUenergy stated that:

A transition period is appropriate for industry to establish a new reporting regime and prepare for reporting emissions that may be required in addition to current reporting arrangements. (submission 39, p. 6)

### 9.3 Adoption of national emissions monitoring and reporting processes

State and Territory Governments recognise that there is a large number of greenhouse and energy monitoring and reporting programs (see box) and fully support efforts to reduce, streamline and harmonise existing reporting requirements.

The National Environment Protection Council<sup>90</sup> and the Ministerial Council on Energy and the Environment Protection and Heritage Council (MCE/EPHC) are carrying out investigations into future national emissions monitoring and reporting options. On 14 July 2006, COAG agreed that a single streamlined system that imposes the least cost and red tape burden is the preferable course of action. To this end, COAG agreed that Senior Officials should report back to COAG in December 2006 with a proposal for streamlining emissions and energy reporting in line with those objectives. The report should be based on the preparation of national purpose-built legislation to provide for cost-effective mandatory reporting and disclosure at the company level at the earliest practicable date. The report will also need to include advice on timing, thresholds and governance arrangements. COAG also agreed that every effort should be made to reach agreement on a national purpose-built legislation by December 2006.<sup>91</sup>

It is the strong preference of the State and Territory Governments that the national processes under way result in the timely delivery of a national emissions monitoring and reporting program that meets the requirements of a NETS, as described above. The State and Territory Governments are working within the national processes to achieve that outcome.

Legislation—either national or NETS-specific—would need to specify data quality and reporting and verification standards appropriate for emissions trading.

This view is also in line with many stakeholder comments. For example, the Energy Supply Association of Australia (ESAA) and the Energy Users' Association of Australia (EUAA) stated in their submissions:

esaa supports the work currently being undertaken by the joint working group formed under MCE and EPHC on the streamlining of energy and greenhouse reporting. The Taskforce should firstly look to use the outcomes of the MCE / EPHC greenhouse reporting work before proceeding with a new or additional reporting requirement or facility specifically for the proposed ETS. (submission 55, p. 7)

In terms of reporting, the EUAA supports using existing reporting regimes wherever possible. The basis for this view is that the administrative costs of the scheme should be minimised at all times. (submission 58, p. 8)

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<sup>90</sup> A statutory body of Ministers with law-making powers under the *National Environment Protection Council Act 1994* (Cth) and corresponding Acts in other jurisdictions. Administratively, it operates under the umbrella of the EPHC.

<sup>91</sup> See COAG Communiqué 14 July 2006 at [www.coag.gov.au](http://www.coag.gov.au)

#### **Existing greenhouse and energy monitoring and reporting programs**

Today there are several monitoring and reporting initiatives on the national level and a similar number of programs at State and Territory level. An electricity generator based in NSW could be subject to (or choose to participate in) nine separate greenhouse and energy programs or initiatives in reporting greenhouse and energy data—four of which are mandatory.

National programs include:

- National Greenhouse Gas Inventory (NGGI)
- National Pollutant Inventory
- ABARE Fuel and Energy Survey
- Greenhouse Challenge Plus
- Energy Efficiency Opportunity Assessment subset of the NFEE
- Australian Petroleum Statistics
- Generator Efficiency Standards
- Mandatory Renewable Energy Target (MRET)
- Greenhouse Friendly.

State and Territory programs include:

- Queensland EcoBiz
- Northern Territory Greenhouse Gas Reporting Program
- NSW & ACT Greenhouse Gas Abatement Scheme
- NSW Energy Savings Plans and Fund
- South Australian Greenhouse Strategy
- Victorian State Environment Protection Policy (Air Quality Management)
- WA Greenhouse Gas Inventory
- WA Greenhouse Registry.

## **9.4 Costs of monitoring, reporting and verification requirements**

The additional costs to businesses for monitoring, reporting and verification under an emissions trading scheme should be relatively low, as businesses will already have systems in place to meet existing greenhouse and energy reporting requirements. However, as described above, the data quality and auditing requirements for emissions trading may be more stringent than those of current programs. At the same time, any increased costs should be offset by removal or streamlining of the reporting requirements for other programs, particularly once the MCE/EPHC process is completed.

In order to achieve a reasonable balance between accuracy and administrative costs, it may be necessary to differentiate monitoring requirements by the scale of a facility's emission levels and hence the significance of a source. In such a case, large emitters would need to

meet more accurate monitoring requirements for the main emission sources than would small emitters or less significant fuel or material streams. If this approach were to be adopted, the criteria for determining such accuracy requirements would need to be unambiguous.<sup>92</sup>

## **9.5 Conclusion**

An effective, credible and efficient emissions monitoring, reporting and verification system would be required to underpin the NETS. The system would make reporting mandatory and would require reporting (but not necessarily disclosure) at facility level, with stringent verification and auditing protocols.

Ideally, State and Territory Governments would like to base emissions monitoring and reporting on streamlined national processes that are currently under development, and to have monitoring and reporting in place by no later than 1 January 2008 if the NETS were to commence in 2010.

If other sectors are included after the commencement of the scheme then they would be required to report at the level required by the emissions trading scheme<sup>93</sup> at least 2 years before their inclusion as liable parties under the scheme's coverage.

Cost impacts of emissions monitoring and reporting under an emissions trading scheme are expected to be relatively low, as monitoring and reporting will be a requirement of separate national processes. Cost savings are expected to occur through the streamlining of reporting requirements under those national processes, and these would act to offset some of the costs of meeting the additional requirements for data quality and auditing that are needed to underpin an emissions trading scheme.

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<sup>92</sup> In the EU ETS the criterion of cost effectiveness was used to determine the level of accuracy. The experience was that such a term was too vague and was interpreted differently by different jurisdictions, leading to discrepancies in data quality (See Ecofys et al. 2005, *First Interim Report Results from Stakeholder Consultation on the Review of the EU-Monitoring and Reporting Guidelines*, [http://ec.europa.eu/environment/climat/emission/pdf/first\\_interim\\_rep.pdf](http://ec.europa.eu/environment/climat/emission/pdf/first_interim_rep.pdf)).

<sup>93</sup> Such facilities are likely to have to report to the national greenhouse and energy reporting framework from a considerably earlier date, but may not have to meet the more stringent requirements of the NETS at that time.

*It is proposed that:*

- *emissions monitoring, reporting and verification at the level required for a NETS commence no later than 1 January 2008 (if the NETS were to commence in 2010), covering all power stations of greater than 30 MWe capacity. Legislation would be required in 2007 to achieve this.*
- *the emissions trading scheme be underpinned by a national emissions monitoring and reporting framework, based on the outcome of processes being carried out by the NEPC and jointly by the MCE and the EPHC.*
- *given the stringent requirements that must be met for emissions monitoring, reporting and verification under an emissions trading scheme, State and Territory Governments are likely to need to establish additional requirements for accuracy and verification for emissions trading. It is expected that most of the costs associated with this would be offset by the removal or streamlining of other reporting requirements.*
- *for verification purposes, data would be monitored at the level that gives the highest accuracy and is verifiable (for example, site / facility level).*

*Comments are sought on these proposals, and on:*

- *the appropriate level of aggregation at which data should be reported to the regulator*
- *the level of aggregation at which data should be made available to the market*
- *the possibility of differentiating the stringency of monitoring and reporting requirements according to the quantity of emissions from a liable party.*

## 10 Accommodating multiple objectives

*The design of a national emissions trading scheme (NETS) needs to accommodate a number of objectives, including:*

- *ensuring environmental integrity*
- *promoting investor certainty*
- *minimising economic impact*
- *ensuring flexibility*
- *equity.*

*This Chapter provides a summary of how the key features of the scheme set out in this Discussion Paper contribute to meeting these objectives. It also provides a summary of how the design has taken into account lessons—both positive and negative—from the world’s largest emissions trading scheme, the EU ETS.*

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### 10.1 Emissions trading — weighing the priorities

Designing a NETS requires striking a balance between a number of priorities. From an environmental perspective it is necessary to ensure that the scheme achieves meaningful reductions in greenhouse gas emissions and makes a significant contribution to Australia’s response to climate change. These reductions need to occur within a stable framework in which firms can invest with confidence. The framework must recognise the implications that imposing a carbon price may have on Australia’s international competitiveness and, where possible, introduce measures to limit any negative implications for economic growth. Finally, the scheme needs to be flexible enough to ensure that it can adapt to changes in international obligations, developments in abatement technologies, and future developments in the science of climate change.

This Chapter summarises the design features that are proposed to address each of these objectives.

### 10.2 Environmental integrity

First and foremost, emissions trading schemes are implemented to achieve environmental objectives.<sup>94</sup> Ensuring the environmental integrity of the scheme is therefore fundamental to the design of the scheme.

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<sup>94</sup> All Australian governments recognise the importance of addressing climate change and have individually introduced a range of other policies and programs in their respective jurisdictions. Some of these initiatives are outlined in Chapter 13.

As the submission received from the Australian Conservation Foundation notes:

A poorly designed emissions trading scheme can actually undermine greenhouse reduction policies. If the scheme fails to reduce emissions it would just be a cost imposed on industry and consumers for no benefit and could lock in unsustainable levels of greenhouse emissions. (submission 50, p. 1)

The development of a possible design for a NETS represents a collective attempt to cap emissions at a level significantly below those estimated under a business as usual scenario. It is proposed that caps initially be placed on the stationary energy sector, which accounts for almost half of national emissions. The level at which the caps are to be set is the subject of ongoing discussion. To inform such discussions, *indicative* caps have been modelled that cap emissions some 33% and 43% below estimated 2030 business as usual emissions (Chapter 3). The design is also flexible enough to accommodate the expansion of coverage to other sectors in the future.

It is proposed that the cap would be supported by a rigorous monitoring and reporting regime. To promote nationally consistent monitoring and reporting standards, a regime is being developed by the Commonwealth and State and Territory Governments through the national processes described in Chapter 9. Emissions monitoring and reporting needs to commence no later than 1 January 2008 (if the NETS were to commence in 2010) to provide sufficient time to develop, implement and refine the appropriate protocols and procedures.

Compliance with the cap would be encouraged through the use of a penalty set at a level above the estimated marginal cost of abatement.

Offset credits created under the scheme would be subject to stringent additionality tests to ensure that only emission reductions beyond business as usual are eligible to create offset credits. It is also proposed that rigorous quantification, reporting and verification protocols for offset projects be developed. These would be guided by international standards and approaches being developed by groups such as the IPCC, the JISC, and the International Standards Organisation (ISO 14064), as well as experience with the NSW & ACT Greenhouse Gas Abatement Scheme and other project-based programs in operation.

The NETT have also given careful consideration to the incentives created by the method through which permits are allocated. This is important from an environmental perspective, as some methods (such as updating; see Chapter 7) can create perverse incentives for firms to increase emissions in order to gain access to additional permits. Furthermore, centralised allocation of permits by the Scheme Regulator would ensure that a consistent approach to allocation was adopted and ensure that over-allocations were avoided.

### **10.3 Investor certainty**

For many investors, climate change, or more specifically the government's response to climate change, is emerging as an important source of uncertainty. This is particularly true for investments that would emit greenhouse gases directly (such as some types of electricity generators), or those that rely heavily on inputs that emit greenhouse gases during their production (such as aluminium producers). These investments are typified by large up-front capital costs and assets with long productive lives. Long-lived investments are more vulnerable to uncertainty for two reasons. First, the longer the life of the investment, the less information there is about variables that may influence its profitability further into the future (some of which are mentioned above). Second, uncertainty raises the rate of return that investors require to undertake an investment (the so-called 'hurdle' rate of return).

Of course, firms routinely deal with risk and uncertainty across a range of issues. Almost every aspect of a firm's costs and revenues is subject to some level of uncertainty. Wage rates may be uncertain beyond the end of the current collective agreement; interest rates may change, affecting the cost of debt; prices of raw materials may be subject to fluctuations in world markets; and product prices may be affected by competition or the development of new technologies. This point is recognised in the submission received from Insurance Australia Group, which states:

It is important to note that all businesses operate with some level of uncertainty. Therefore a level of uncertainty associated with medium to long term caps and targets could be considered as one of many variables that businesses need to deal with on a day to day basis (submission 10, p. 3).

That said, the energy sector has particular characteristics that make uncertainty about future policies to reduce climate change particularly important. This is because assets tend to be very long-lived, and once investments are made the costs are essentially sunk. The wrong decision on technology or fuel choice can have extraordinarily expensive consequences for the investor. To encourage firms to make the required long-term investments in a manner that promotes Australia's capacity to achieve large reductions in emissions in the future, a range of features has been included in the proposed scheme design to promote investor certainty wherever appropriate.

A stable investment environment in which business can make reasonable assessments about future risks and opportunities is desirable. A clear market signal for emissions, combined with a penalty that caps costs, would reduce future uncertainty and provide a sound policy environment in which investments could be made.



### **10.3.1 Certainty for firms covered under the scheme**

In developing a possible design for the NETS, careful consideration has been given to ensuring that firms covered by the scheme can be provided with as much certainty about the current and future policy environment as is practicable. This point was raised in several submissions. For example, EnergyAustralia stated:

It is important that regulatory certainty becomes an essential feature of the model. This will require that the model adopt a long term outlook to deliver and encourage new investment in emission reduction capacities. Therefore, scheme caps should be set against medium to long-term targets (submission 15, p. 3).

In a broad sense this could begin with setting a long-term aspirational target of reducing national emissions by around 60% by the middle of the century, compared with 2000 levels. More specifically, it is proposed that firm annual caps would be set for the first 10 years of the scheme. Every year, the firm cap would be extended by another year. The upper and lower bounds of possible future caps ('gateways') would also be set for the second 10 years and extended on a five-yearly basis. These gateways provide the limits within which firm annual caps can be extended.

Similarly, because decisions about permit allocation would occur before the commencement of the scheme, liable firms would know how many permits they have, and how many they would require to meet their obligations given their expected emissions profiles. In this way, liable firms can start to analyse their alternative abatement strategies well in advance of actually having to comply. The proposed 'one-off' allocation of permits would also facilitate the development of a futures market for permits, allowing firms to manage fluctuations in permit prices more effectively.

The price of permits to emit in future years would reflect the market's assessment of the likely supply and demand conditions at that point in time. These conditions may be influenced by the expansion of the scheme to cover new areas of the economy. It is proposed that a minimum notice period of 5 years should be given before a new activity or sector is included under the cap (refer Chapter 2). This would allow time for liable parties to prepare for coverage and for market participants to factor the change of coverage into their estimates of permit price and availability.

Similarly, rules governing the treatment of new entrants would be specified from the outset, thus providing additional information and certainty to the market. Auctioning some permits before the scheme's commencement would also assist certainty for potential investors by ensuring a robust price signal is generated from the outset of the scheme.

This is a key point that was raised in the submission from the Centre for Energy and Environmental Markets, which stated:

Allocation has certainly proved to be extremely controversial in schemes implemented to date. Auctioning seems to be the best way for allocating permits since any possible windfall gains from free allocation are avoided and the ‘polluter pays’ principle is applied. In addition it will give an early price signal of marginal abatement costs—a signal which still seems to be missing under the EU ETS given its grandfathering arrangements. (submission 59, p. 21)

Allowing businesses to bank permits would also increase investor certainty, since it would dampen price fluctuations and give the investor the option to save permits instead of selling them on the market. Thus investors would be better able to manage permit price uncertainty through the life of their investments.

It is proposed that for at least the first 10 years of the scheme a civil penalty for non-compliance should be set, and firms should not be required to ‘make good’ any emissions reductions for which a penalty is paid (see Chapter 4). This **effectively sets a ceiling on the price** that firms would have to pay for permits, providing investors with certainty around their maximum liabilities. This approach was supported by a number of submissions, including that received from AGL, which commented:

The penalty should be set just above the estimated marginal cost of compliance (determined by economic modelling). By setting the penalty at this level and adjusting the penalty over time to account for inflation, there is no financial incentive for industry to avoid reducing emissions. However, if the modelling has significantly underestimated the cost of compliance, the penalty will act to cap the cost of the scheme. This will provide business with investment certainty (submission 37, p. 7).

It is also canvassed in this Discussion Paper that firms be allowed to “use” credits created under the CDM to meet their obligations under the NETS. This effectively provides investors with an additional price ‘safety valve’. If the price of domestic credits reached the price of the international credits, liable entities would have an incentive to use international credits to meet compliance obligations. Thus investors would have some certainty that the price they would pay for permits would not exceed that of credits created via the CDM.<sup>95</sup> This is explained in further detail in Chapter 5.

The manner in which permits are defined would also add certainty for investors. It is proposed that permits represent legal property rights that can be bought and sold like any other asset. This has two important implications. First, permits could not be cancelled or otherwise acquired without compensation being paid to their owners.

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<sup>95</sup> International experts have advised that current indications are that at least 1.25 billion CERs will be generated by the end of 2012 and that the price will be in the range of 10 to 15 Euros per CER, or approximately AUS \$17 to \$25. (*Possible Use of Kyoto Credits in a National Emissions Trading Scheme*, Report prepared for the Taskforce by Erik Haites, Margaree Consultants, 2006.)

Second, firms that are considering closing would be able to sell any permit that they have been allocated in the same way as they would be able to sell any other asset associated with the business. A discussion on the treatment of permits held by closing firms is provided in Chapter 7.

The importance of well-specified property rights was stressed in a number of submissions. The Australian Industry Greenhouse Network, for example, stated:

Should governments adopt emissions trading as a primary instrument of this challenge, the objective of providing greater certainty for investors, and the community as a whole, can only be met if the permits to be traded provide secure property rights. (submission 47, p. 10)

The proposed institutional arrangements outlined in Chapters 8 and 9 also provide investors with additional certainty. For example, a national approach to monitoring and enforcement is proposed to ensure that the firms in all jurisdictions are treated equally. This would increase confidence that an investment in one part of the country would not be at a competitive disadvantage because different arrangements apply in different jurisdictions.

## **10.4 A manageable transition for the economy**

The basic rationale for introducing an emissions trading scheme is that it would enable society to achieve a desired reduction in emissions at least cost. However, any policy that restricts greenhouse gas emissions creates changes in the economy, and these need to be managed carefully.

In developing its design, the Taskforce has given careful consideration to designing a system that attempts to minimise adverse economic impacts. This is particularly important given that many of our international competitors do not, as yet, have comparable policies to reduce emissions—a point raised by several industry stakeholders. The submission received from the Plastics and Chemical Industry Association was typical of those received from trade-exposed groups:

Energy represents a substantial cost for most products of the C&P [chemical and plastics] sectors, and Australia's reliable energy supply at costs which are low by international standards is vital to these sectors' capacity to compete with imports. Much of the import competition in the Australian market comes from Asia—from developing countries which have recognised low labour and other input costs, and protected domestic markets. These countries (which are estimated to account for about one-third of world GHG emissions) have indicated— unequivocally—that they do not propose to implement measures to reduce or abate GHG emissions. (submission 11, p. 3)

Key features of the possible scheme design that are aimed at ensuring a manageable transition for the Australian economy include:

- Examining caps that recognise the capacity of the covered sectors to reduce emissions within a timeframe at reasonable cost (see Chapter 3).
- The use of gateways that allow new information about the costs and abatement options to be taken into account through time (see Chapter 3).
- A soft start to the scheme, with more stringent caps in future years to allow time for firms covered under the cap to become familiar with the emissions trading regime and to assess their abatement options (see Chapter 3).
- Unrestricted banking of permits to allow liable parties to manage cyclical variations in emissions more efficiently (see Chapter 3).
- Use of set penalties but no make-good provisions to ensure that the cost of compliance does not exceed a predetermined level (see Chapter 4).
- Inclusion of offset credits to encourage low-cost abatement projects outside sectors covered by the cap and thereby lower the overall compliance cost of the scheme (see Chapter 5).
- The possible recognition of credits created under the CDM as an additional price 'safety valve' (see Chapter 5).
- Free allocation of some permits as a form of adjustment assistance for some existing generators and for energy-intensive trade-exposed industries (see Chapter 7). This would help to reduce any loss in asset value experienced by firms directly affected by implementation of the scheme.
- Free allocation of some permits to new entrants in energy-intensive trade-exposed industries (see Chapter 7).
- Compensation to other groups via the use of revenue raised from the auctioning of permits (see Chapter 7). The mechanisms for compensating households would be left to State and Territory Governments to design, so that local assistance priorities and existing programs could be taken into account.
- Limiting the emphasis on bilateral trading with similar schemes overseas, because of uncertainty over the net impact this could have on the Australian economy (see Chapter 12).

## 10.5 Flexibility

Many aspects of the emissions trading scheme design set out in this Discussion Paper are aimed at increasing certainty for investors. However, advances in technology and the science of climate change are likely to occur in the future. Similarly, Australia's international obligations with respect to greenhouse gas emissions reductions may become more certain over time.

The preferred design for the NETS should be flexible enough to cope with these developments as they arise and, subsequently, with any changes to the approach adopted by the Commonwealth Government. This is the major constraint on committing to firm caps for longer than 10 years, which would otherwise be desirable on a range of fronts. Flexibility would be achieved partly via the **use of gateways that would allow caps to adjust for any future international arrangements** relevant to Australia. It would also be achieved by ensuring that the scheme design is generally consistent with emerging emissions trading schemes overseas, allowing for the possibility of more comprehensive linking in the future, should this be considered desirable.

The need for the scheme to be flexible enough to adapt to changes in the policy environment was noted in a number of submissions. The Institute of Actuaries of Australia, for example, stated:

The basic principles of the scheme should include ... (f)lexibility to allow for changes in Australia's economic structure brought about by factors such as technological change and global developments, including the international response to the GHG control measures ... (submission 28, p. 2)

## 10.6 Equity

A strength of an emissions trading scheme compared with alternative measures is that it has an inbuilt mechanism for providing adjustment assistance. Scarce permits to emit greenhouse gases have value. The way in which this value is allocated can be used as a way of ensuring that those who are likely to be most adversely affected by the introduction of the scheme are assisted.

It is proposed that permits would be allocated in three broad tranches:

- Some permits could be allocated for free to those existing generators estimated to be significantly adversely affected by the implementation of the scheme.
- Some permits would be allocated for free to firms in trade-exposed, energy-intensive industries (both existing and new).

- The remainder of permits would be auctioned. Auction revenue would be divided among the State and Territory Governments on a basis yet to be determined, but in a manner that recognises the differing impacts of the scheme. This revenue could be used to fund assistance measures for other groups, such as households, regions and small business.

## **10.7 Lessons from the EU ETS**

An important part of designing a scheme to meet the needs of environmental integrity, providing an economically manageable transition for the economy, promoting investor certainty and maintaining appropriate flexibility, is to learn from the experiences of others. The most obvious example is the EU ETS, which commenced in 2005.

The EU ETS is the largest cap and trade scheme in the world, covering around 11,500 industrial plants across 25 member states. The European Commission is currently undertaking a review of the scheme, and the review is due to be presented to the European Council and the European Parliament in late 2006. The review will look at a range of issues, including whether further sectors and greenhouse gases should be included in the scheme. Any changes made through the review are intended to take effect after 2012.

Although the review was not complete at the time of preparing this Discussion Paper, the preliminary findings from it, along with expert market commentary, provide some valuable lessons for the design and administration of a large-scale emissions trading scheme in Australia. Some of these lessons and how they have influenced the proposals in the preceding chapters of this Discussion Paper are discussed below.

### **10.7.1 Longer time frames are needed to provide certainty**

The EU ETS came into operation in January 2005, with the first phase running to the end of 2007, after which several key aspects of the scheme (such as allocation and coverage) may change. A survey of EU ETS stakeholders and participants, commissioned by the EU as part of its review, has indicated that uncertainty created by the short initial phase is the biggest obstacle to market liquidity.<sup>96</sup> The large majority of companies and associations surveyed indicated that they would prefer phases (allocation periods) of 10 years or more, with national allocation plans being announced 2 or 3 years before allocation.<sup>97</sup>

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<sup>96</sup> European Commission, Directorate General for Environment, *Review of the EU Emissions Trading Scheme – Survey Highlights*, survey conducted by McKinsey and Company and Ecofys, November 2005.

<sup>97</sup> Ibid.

The design set out in this Discussion Paper includes a rolling 10 year period of firm annual caps and, as stated in Chapter 7, it is proposed that up-front, long-term decisions on the allocation of permits should be made.

### **10.7.2 Firms will pass on costs to consumers**

There is mounting evidence to suggest that firms covered by the EU ETS are passing the (opportunity) cost of permits on to consumers even where the permits have been allocated for free. Given that most generators received a very high proportion of their permit requirements for free, this has led to **windfall gains** for some generators at the expense of energy consumers. The European Commission's survey of stakeholders and participants indicated that 70% of generators currently 'price in' the value of permits into marginal pricing decisions.<sup>98</sup> No additional allocation of permits above baseline emissions levels was made to trade-exposed, large electricity users, who would bear the burden of higher electricity costs.

For the scheme set out in this Discussion Paper, it is proposed that generators only be allocated sufficient free permits to offset estimated reductions in operating profits. This is a different approach to that adopted in the EU, where the majority of permits were allocated on the basis of historical emissions (that is, grandfathered). Also, it is proposed that trade-exposed, energy-intensive users be allocated some free permits, and that the remainder of permits be auctioned with this revenue returned to the State and Territory Governments on a basis yet to be determined, but in a manner that recognises the differing impacts of the scheme.

### **10.7.3 Allocation rules and caps need to be transparent and simple to understand**

The European Commission has acknowledged that a key lesson from the first trading period is that allocation plans and targets have been overly complex and have lacked transparency.<sup>99</sup> This has meant that it has been difficult for market participants to predict the impact of allocation plans on underlying supply conditions in the market. This has added to uncertainty and made it difficult for market participants to develop informed trading and investment strategies. To a large extent this issue arises because each country (or Member State) is responsible for developing its own allocation plan, resulting in varying approaches to allocation.

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<sup>98</sup> Ibid, p. 5

<sup>99</sup> See <http://europa.eu.int/comm/environment/climat/emission.htm>

For the NETS, it is proposed that permits be centrally allocated by the Scheme Regulator using transparent approaches. These approaches would be made available for public scrutiny well in advance of allocation actually occurring.

#### **10.7.4 Efficient coverage of installations**

The EU ETS covers facilities with various emission sizes, some of them with very small greenhouse gas emissions. Around 50% of the installations covered received less than 2% of the total allocated emissions allowances in the first phase. It is questionable whether it is efficient to include such a large number of small installations—many of which have limited abatement opportunities but large participation costs—in an emissions trading scheme, or to deal with them under another climate change policy.

The NETT therefore propose that a NETS initially consider coverage of only generators with a capacity of at least 30 MWe, and five years after the commencement of the scheme, facilities with yearly stationary emissions of at least 25 000 t CO<sub>2</sub>-e. Smaller emitters—for example, smaller gas users—would be covered indirectly through gas retailers or covered by alternative climate change policies.

#### **10.7.5 Take time to plan the design of the scheme**

Many market participants and stakeholders believe that the first implementation phase of the EU ETS took place under considerable time pressure, and that additional time to prepare for implementation would have been beneficial.<sup>100</sup>

The NETT recognise this as an important issue and as such are proposing that the scheme commence no earlier than 2010. It is proposed that all key elements of the scheme (particularly monitoring, reporting, and the detailed regulations and rules) be developed with extensive consultation, with the intention of addressing any issues before they arise.

#### **10.7.6 Need to encourage early price discovery**

For any market to operate efficiently, potential market participants must be presented with an opportunity to compare the value they place on an item with the value that others place on that item (that is, to discover the market price). This is particularly true for ‘designer markets’, such as those created when an emissions trading scheme is introduced. Some commentators have stated that initial allocation methods and the accuracy of emissions

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<sup>100</sup> European Commission, Directorate General for Environment, 2005.



data in the EU ETS have limited price discovery in the early stages of the market and have failed to provide adequate information to the market on the true scarcity of permits.<sup>101</sup>

Under the design for the NETS set out in this Discussion Paper, price discovery and market liquidity would be encouraged in three ways. First, monitoring and reporting would be in place well before the start of the scheme to allow emitters to better understand the levels and physical drivers of their emissions. Second, a proportion of permits would be auctioned and the revenue could be used by State and Territory Governments to compensate other energy users affected by the scheme. This auction process would aid price discovery and enhance permit availability. Third, permits would be allocated to large trade-exposed energy users, including large users of electricity, as a form of compensation. Because electricity users would not be liable parties in their own right they would have an incentive to sell permits to recoup their value, further enhancing liquidity in the permit market.

#### **10.7.7 Cooperation is possible**

Perhaps one of the greatest lessons to arise from the EU ETS is that multi-jurisdictional cooperation is possible between parties with contrasting positions. Australian jurisdictions have cooperated on many difficult and controversial issues in the past. Reducing greenhouse emissions is an important issue that should—and can—be tackled collectively.

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<sup>101</sup> See for example Point Carbon, *Carbon Market Europe* 5 May 2006. [www.pointcarbon.com](http://www.pointcarbon.com)

## **10.8 Conclusion**

The introduction of a functioning greenhouse gas emissions trading market would provide an important step towards achieving meaningful cuts in emissions while creating the long-term policy certainty required by investors.

The most obvious contribution that the scheme design makes is to impose a cap on greenhouse gas emissions and establish a framework for achieving large-scale reductions in emissions in the future. Other scheme elements that promote environmental integrity include stringent offset accreditation procedures, rigorous monitoring and enforcement procedures, and penalties to encourage compliance.

In developing the design set out in this Discussion Paper, the Taskforce has given careful consideration to ensuring that firms covered under the scheme are provided with as much certainty as possible regarding their current and future obligations, the cost of compliance, the impact of the scheme on the value of their assets, and the impact that any future changes to the scheme may have on their property rights.

A carefully designed national emissions trading scheme could allow Australia to achieve reductions in carbon emissions in a flexible and cost-effective manner. Nevertheless, bringing the cost of emissions to account would have impacts on various groups in the community, and this process requires management. These impacts are proposed to be managed through phased introduction of the scheme; the setting of caps that take into account the timing and scale of major investments in the energy market; the provision of assistance to existing generators, and trade-exposed, energy-intensive firms through free allocation of some permits, and to others through the use of auction revenues; and design of the scheme in such a way as to minimise transaction costs to both industry and government.

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## 11 Transitioning to the NETS

*This Chapter discusses the activities that would need to occur before the start of a NETS, and any transitional arrangements associated with existing schemes.*

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### 11.1 Setting the foundations for scheme commencement

Before the NETS could commence, a variety of activities would need to be undertaken to ensure that the transition to the NETS would be as smooth as possible.

The timing of certain activities, particularly those involving monitoring and reporting, would be critical to ensure that policy makers, participants and scheme regulators have sufficiently accurate data on which to base their analysis and decisions. It is clear from recent experience in the EU ETS that unless reasonably accurate emissions data are available for the periods before scheme commencement, then implementation (including early caps and permit allocations) would be much more difficult.

*Comments are sought on any additional issues that should be considered and on other hurdles that may need to be overcome to achieve the desired outcomes.*

#### 11.1.1 Developing and enacting legislation to support the NETS

Chapter 8 describes the options available for developing and enacting legislation to support the NETS.

Legislation would be required so that formal work on implementing the national emissions trading scheme could commence, especially establishing any new institutions. Legislation would ideally need to be in place in 2007 to enable commencement of the scheme by 2010). Regulations and rules (containing finer detail) could be developed over a longer period, provided that they were substantially in place by the end of 2008. Given the level of detail anticipated in these documents, significant stakeholder consultation would be desirable. In addition, some degree of flexibility would be required—as with all schemes, regulations and rules may require some degree of ‘fine tuning’ over time.

### **11.1.2 Establishing and developing the required institutions**

Chapter 8 also examines the institutional arrangements needed to support the development, implementation and operation of the NETS.

Establishment of the necessary institutions (the Ministerial Council/Forum, Scheme Developer and Scheme Regulator) would need to commence as soon as possible after the enabling legislation has been passed. This is to ensure that the systems (particularly the processes necessary for permit allocation: see Chapter 7) are up and running as soon as possible.

It would take some time to source the appropriate set of skills to staff the new institutions. There is a limited pool of personnel within Australia with appropriate skills and experience, and there is increasing demand for these skills internationally and within the private sector.

The Inter-Governmental Agreement (Section 8.2) would need to specify funding arrangements for the new institutions, both at their establishment phase and for their ongoing operation. A range of cost-recovery options would need to be considered. Over time, most of the administrative costs of the scheme should be covered through fees, such as offset project verification charges or permit registration charges.

The registry is another area where early action would be required. Three Australian schemes already make use of registries, and their implementation has not proven overly complex. However, the need in this case for links with national reporting processes and potentially an international registry (for CDM credits) may mean that a longer lead-time is required.

### **11.1.3 Monitoring, reporting and verification of emissions**

The scheme's requirements in terms of monitoring, reporting and verifying emissions are discussed in Chapter 9. From a transitional point of view, it is important that such measures are in place well in advance of scheme commencement, no later than 1 January 2008 if the scheme were to commence in 2010. This was a key lesson learned from the experience of the EU ETS. The early introduction of mandatory monitoring and reporting of emissions would also assist scheme participants to prepare for emissions trading by providing a more accurate picture of their emissions, which may help them assess where reductions are possible and cost-effective. The publication of aggregated data on emissions would also help all market participants to assess the likely scarcity (and hence the price) of permits in the early years of the scheme.

#### **11.1.4 Designing and implementing permit allocation processes**

As discussed in Chapter 7, it is proposed that long-term permit allocation decisions should be made in advance of the start of the scheme. Allocations would be made according to a plan developed by the Scheme Developer, approved by the Ministerial Council/Forum, and administered by the Scheme Regulator.

The proposed approach of allocating permits to existing generators and trade-exposed, energy-intensive users relies on a process of estimating the impacts of the scheme in advance. Robust monitoring, reporting and verification arrangements would inform this process. It would require the appointment of experts, with industry input, to advise on matters such as appropriate assumptions to use in making the necessary estimates. In order for the process to be transparent and consultative, it would take some time to complete. To ensure that participants are aware of their allocations in advance, this process would need to be completed by not later than mid-2009 if the scheme were to commence in 2010.

Auction design is another important element of the permit allocation process. An initial auction of permits—which should include a proportion of permits from future years—should occur before the scheme commences.

#### **11.1.5 Defining rules and procedures for offsets projects**

Before the scheme commences, detailed rules for offsets projects would need to be established. As discussed in Chapter 5, where possible, methodologies should be consistent with those used under the JI mechanism. However, there is still likely to be considerable effort required to develop appropriate arrangements for domestic offsets. These methodologies would need to be set out in detail and preferably trialled on live projects before final implementation. Besides the rules for creating offsets, the Scheme Regulator would need to establish appropriate processes for project registration and offset credit creation, provide training for project verifiers and auditors, and develop the framework that these verifiers and auditors would use.

#### **11.1.6 Capacity-building and education of participants and stakeholders**

The NETS would create a new market, and its operation would require the development of new capacities in a variety of sectors.

A significant education campaign would be required to inform the public of the aims of the scheme, and how it would operate.

Within governments, effort would be required to ensure that all agencies are aware of the scheme and take its presence into account when considering and designing policies that could be affected by the scheme's operation.

Liable parties need to know what their obligations would be and to have experience in the monitoring and reporting arrangements that would be set up.

For market participants, it is likely that 'dry runs' of trading and operating decisions would be desirable. For example, before the NEM 'went live', traders were involved in 'paper trading' alongside their actual generating behaviour. This served several useful purposes, such as giving policy makers an insight into how prices were likely to be set in the new market, and giving traders the opportunity to develop their skills and learn what to expect.

Potential offsets providers would also need to make themselves aware of the new opportunities being created by the scheme and of the monitoring, reporting and verification requirements that would be placed upon them.

Finally, intermediaries, such as banks, lawyers and traders would also need to be made aware of the implications of the scheme if they are to ensure that abatement projects, contractual arrangements and trading of permits and credits are able to proceed smoothly. For example, the accounting and taxation treatment of permits (including those allocated for free) would need to be clear.

The responsibility for capacity building and awareness raising would rest with the Scheme Regulator for specific areas such as building capacity among verifiers and auditors, and trialling offset project methodologies. The Scheme Developer would be responsible for more general public education activities.

## **11.2 Harmonisation with existing market mechanisms**

There is currently a variety of market-based mechanisms in place within Australia. Each of these schemes has its own objectives, timeframes and compliance mechanisms aimed at achieving a specific set of outcomes at least overall cost to the economy. Given the overlap between the coverage of existing schemes and the NETS set out in this Discussion Paper, it is important to examine the implications for groups of participants to ensure that disruptions to those participants are minimised and that there is a reasonable degree of certainty to facilitate investment decisions prior to the commencement of the NETS.

Consideration has been given to how the NETS would operate with respect to the existing market mechanisms that have been put in place to encourage lower emissions outcomes.

This Section examines the implications of commencement of the NETS at the start of 2010 for the various participants in the following market mechanisms:

- the MRET implemented by the Commonwealth Government
- the VRET in Victoria
- the Queensland 13% Gas Scheme
- the GGAS operating in NSW and the ACT.

It would be up to the relevant governments to decide and legislate on any modifications or adjustments to the schemes that they consider appropriate.

### **11.2.1 Stakeholder views**

A number of submissions to the Taskforce commented on harmonisation of the NETS with existing market mechanisms. Opinions were divided over whether or not existing policies should continue after a national emissions trading scheme was introduced. Understandably, there was considerable support from the renewable energy sector for the continuation of the MRET. The submission from Renewable Energy Generators Australia (REGA) was typical of those received from the sector. This submission stated:

REGA does not believe any design limitations exist that would prohibit MRET continuing to operate in parallel with a NETS. Indeed this has occurred in many European countries where national renewable energy targets coexist with the recently implemented EU ETS. (submission 38, p. 9)

Several energy users, on the other hand, expressed strong opposition to the continuation of existing policies, as they saw these as duplications that would unnecessarily increase the cost of production. The submission from the Australian Plantation Products & Paper Industry Council (A3P), for example, stated:

... the benefits of an emissions trading scheme can only be captured if other policy instruments directed at a similar outcome cease. This should occur at both a national and state level. The list of policy instruments that should cease if an emissions trading scheme were introduced include the Commonwealth Mandatory Renewable Energy Target; the NSW and ACT Greenhouse Benchmark Schemes; the Qld 13% Gas Scheme; as well as a significant recasting of energy efficiency programs at a national and state level. (submission 64, p. 7)

Particular reference was made by some stakeholders to the value embodied in contracts for future supply or purchase of the existing instruments (RECs, GECs, and NGACs). Most agreed that governments should consider these positions in relation to managing transitions and investment certainty before the commencement of the NETS.

### **11.2.2 Mandatory Renewable Energy Target (MRET)**

#### *Background*

The major existing policy mechanism to encourage additional investment in renewable energy projects in Australia is the Commonwealth's MRET. It places a legal liability on wholesale purchasers of electricity to proportionately contribute towards the generation of an additional 9500 GWh of renewable energy a year by 2010 and then maintain those levels to 2020. The measure is being phased in by specifying a number of interim targets over the period 2001–10.

Liable parties meet their obligations under MRET by surrendering RECs to the Regulator equal to their annual requirement, or pay a penalty. RECs can be created by renewable generators using a wide variety of technologies (for example, hydro, wind, solar, biomass, landfill gas, sewage gas, solar hot water, fuel cells and hot dry rocks).<sup>102</sup>

#### *Impact of the NETS on MRET participants*

Implementation of the NETS as set out in this Discussion Paper would have very little direct effect on the operation of MRET. Liabilities under MRET are based on wholesale electricity purchases, rather than direct emissions, so there would be only a small number of liable parties under MRET that also come under the coverage of the NETS (for example, large industrial or mining facilities that purchase electricity from the wholesale market as well as having electricity generating capacities of 30 MW or over).

As described in Chapters 2 and 5, generators of renewable energy would not be liable parties under the NETS and, to avoid double counting, are not proposed to be included as eligible offsets projects. However, increased electricity prices, projected to result from the implementation of the NETS, would improve the viability of renewable energy projects and may well complement the effectiveness of MRET in terms of driving the increased take-up of renewable energy options.

It should be noted that MRET is primarily an industry development scheme rather than a pure abatement scheme. This, combined with MRET's focus on wholesale purchasers of electricity and zero-emissions generators, means that MRET in its current form can readily operate in parallel with the NETS. It is anticipated that the Commonwealth would continue to operate MRET as legislated until at least 2020, as well as pursuing other initiatives to encourage the take-up of renewable energy options.

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<sup>102</sup> Further detail on MRET is available from the Regulator's website: [www.orer.gov.au](http://www.orer.gov.au)



### **11.2.3 Victorian Renewable Energy Target (VRET)**

The Victorian Government is introducing a market-based renewable energy scheme (the 'Victorian Renewable Energy Target') to drive the development of renewable energy in Victoria. The VRET scheme gives effect to the Government's commitment to meet its target to increase the share of Victoria's electricity consumption from renewable energy sources to 10 per cent and to facilitate 1,000 mega watts of wind power generation.

The Victorian Government has set a target for an additional 3,274 Gigawatt hours of electricity to be produced from renewable energy sources by 2016 (equating to 10 per cent of total Victorian electricity consumption in 2016). The scheme will start on 1 January 2007 and end on 31 December 2030, with an independent review to be held in 2011.

Accredited power stations will be able to create Victorian Renewable Energy Certificates (VRECs) for electricity generated from eligible renewable energy sources under the proposed scheme. The VRET scheme recognises the same eligible sources as MRET – excepting solar hot water – for example, hydro, solar, wind, biogas.

The scheme imposes an obligation on electricity retailers and wholesale buyers to proportionately contribute towards this target, by sourcing a proportion of their electricity from renewable sources. They can do this by acquiring and surrendering VRECs. Large energy-intensive, trade-exposed industries may be exempted from the scheme through an Order in Council.

The scheme will leverage the systems and administrative infrastructure currently used in the operation of MRET.

As with MRET, a VRET will be able to operate in parallel with the NETS without causing any problems of double counting. The level of incentive provided to renewable energy generators by a VRET would depend on the targets, penalties and eligibility details of the scheme, which would all need to be determined by the Victorian Government.

### **11.2.4 Queensland 13% Gas Scheme**

#### *Background*

The Queensland 13% Gas Scheme, implemented through the *Queensland Electricity Act 1994*, commenced operation in 2005 and will operate for 15 years. The scheme is similar in design to the Commonwealth's MRET and requires electricity retailers and some other liable parties to obtain 13% of the electricity sold or used in Queensland from power generated with eligible gaseous fuels.

In order to comply with the scheme, the appropriate number of gas electricity certificates (GECs) must be surrendered by the liable parties to the Regulator each year or a penalty is imposed. GECs may be created by a power station generating electricity:

- from an eligible fuel source (that is, natural gas; coal seam gas, including waste coalmine gas; liquefied petroleum gas; and waste gases associated with conventional petroleum refining); and
- above its baseline (representing gas-fired generation as at 24 May 2000); and
- that supports the electricity load in Queensland (dealt with by applying a Queensland Usage Factor and loss factors).

The scheme essentially provides a positive price signal for the development and operation of gas-fired power generators supplying the Queensland electricity market.

#### *Impact of the NETS on scheme participants*

If the NETS were to commence in 2010, all power generators with capacities of 30 MW or above would have their emissions capped, including a number of generators eligible to create GECs. The permit allocation process proposed for the NETS (as described in Chapter 7) would consider the financial impact of the transition to the scheme on individual generators.

As part of the ongoing investigation of a design for the NETS, the Queensland Government would need to consider all affected stakeholders in Queensland, including gas-fired power generators and other participants in the 13% Gas Scheme. As with MRET, the Queensland 13% Gas Scheme would be able to operate in parallel to the NETS without causing any problems of double counting, continuing to provide additional incentives for gas-fired power generation in Queensland in line with the objectives of the Queensland Government.

### **11.2.5 NSW and ACT Greenhouse Gas Abatement Scheme (GGAS)**

#### *Background*

The NSW and ACT GGAS is one of the first mandatory greenhouse gas emissions trading schemes in the world. GGAS aims to reduce greenhouse gas emissions associated with the production and use of electricity and to encourage participation in activities to offset the production of greenhouse gas emissions.<sup>103</sup>

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<sup>103</sup> The Scheme Administrator (the NSW Independent Pricing and Regulatory Tribunal (IPART)) provides more detailed information on GGAS on its website at: [www.greenhousegas.nsw.gov.au](http://www.greenhousegas.nsw.gov.au)

GGAS is a State-based scheme, initially legislated to run from the start of 2003 to the end of 2012, which places responsibility on electricity retailers and wholesale market customers ('Benchmark Participants') to reduce emissions associated with the electricity used in NSW and the ACT.<sup>104</sup> As most liable parties do not directly emit greenhouse gases from electricity production, their 'attributable' emissions have to be calculated from an average emissions rate (or 'baseline'). They reduce emissions relative to this baseline by surrendering GGAS abatement certificates (NGACs or LUACs<sup>105</sup>) which have been created by registered abatement projects. It is projected that in the later years of GGAS, around 20 million abatement certificates would be required to be surrendered each year.

Benchmark Participants achieve their individual benchmarks by surrendering GGAS abatement certificates created from project-based emission reduction activities. The surrender of these certificates effectively offsets a portion of the greenhouse gas emissions associated with the Benchmark Participant's electricity sales or purchases. If a Benchmark Participant fails to surrender enough GGAS abatement certificates to meet its mandatory benchmark, then a penalty is payable. Currently the penalty level is set at \$11 per t CO<sub>2</sub>-e of shortfall.<sup>106</sup>

Project-based emission-reduction activities from which GGAS abatement certificates can be created include:

- low-emission generation of electricity (including cogeneration) or improvements in the emission intensity of existing generation activities (Rule 2—Generation)
- activities that result in reduced consumption of electricity (Rule 3—Demand Side Abatement)
- activities carried out by energy-intensive industries<sup>107</sup> that reduce on-site emissions not directly related to electricity consumption, including industrial process emissions and combustion of coal and gas (Rule 4—Large User Abatement)

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<sup>104</sup> The ACT Government introduced a Greenhouse Gas Abatement Scheme on 1 January 2005 that mirrors the NSW GGAS. IPART has been appointed the Scheme Administrator for the NSW Scheme, whereas the ACT Compliance Regulator is the ACT's Independent Competition and Regulatory Commission (ICRC).

<sup>105</sup> Each abatement certificate represents emission reductions or removals of 1 tonne of CO<sub>2</sub>-e. NGACs are tradable, whereas LUACs are not tradable.

<sup>106</sup> As payment of penalties is not tax deductible for businesses, the price that they are willing to pay to avoid the penalty is actually more than the penalty itself. With an \$11 penalty, the effective ceiling for abatement certificate prices is around \$15.70/t CO<sub>2</sub>-e (based on a 30% corporate tax rate).

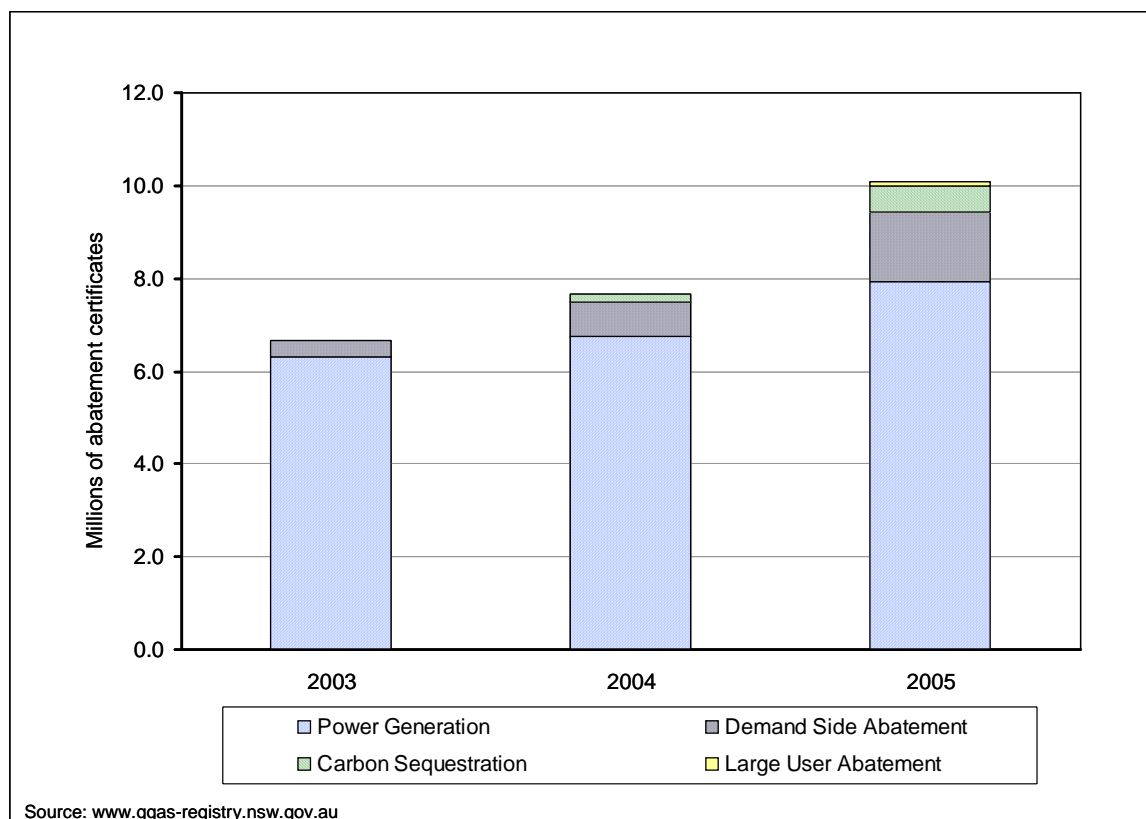
<sup>107</sup> Definition of a 'large user' is currently set at greater than 100 GWh of electricity consumption a year spread across a corporate entity, with at least one site consuming more than 50 GWh of electricity a year. Eligible large users must elect in to GGAS and must meet the benchmark obligation associated with their electricity use. For further details see GGAS Rule 1—Compliance, and other documentation, available at [www.greenhousegas.nsw.gov.au](http://www.greenhousegas.nsw.gov.au)

- the capture of carbon from the atmosphere in forests (Rule 5—Carbon Sequestration).

The effect of these rules is that GGAS covers abatement from the electricity sector and also recognises eligible abatement from other sectors, including waste processes, industrial facilities and fugitive emissions from coal mining, as well as recognising greenhouse gas removals through sequestration in forests.

GGAS has been in operation since the beginning of 2003, and as at 30 June 2006 there were 164 registered abatement projects. The volume and distribution of GGAS abatement certificates created for abatement in the first 3 years of operation are shown in Figure 11-1. It is clear that the majority of GGAS abatement activity to date is under Rule 2—Generation, and projections by the GGAS Administrator show that this trend is expected to continue.

**Figure 11-1: Sources of GGAS abatement certificates for the first 3 years (2003–05)**



Many of the major providers of GGAS abatement certificates would be subject to the emissions cap under the NETS from the beginning of 2010 (that is, power generators with capacities of at least 30MW, and perhaps large users of coal and gas). Other projects eligible under GGAS may be able to be registered under the NETS as offsets project proponents and create offset credits<sup>108</sup> (that is, carbon sequestration, avoided methane emissions, industrial process improvements).

However, a number of abatement projects recognised under GGAS would not be covered by, or be eligible to participate in, the NETS (based on the possible design of the scheme set out in this Discussion Paper). This group includes electrical energy-efficiency projects and small-scale power generation (with capacities of less than 30 MWe). It is anticipated that the economic viability of these projects would be improved with the introduction of the NETS as a result of the expected increases in electricity prices. The NSW Government would consider the impact of the transition from GGAS to the NETS, including the implementation of complementary measures (such as those described in Chapter 13) to overcome non-financial barriers to investment.

#### *GGAS extension*

The NSW Government has announced the extension of the NSW GGAS ‘from 2012–20 and beyond until a NETS is established.’ The extension of GGAS is intended to provide certainty to the market and industry that investment in low greenhouse-intensity generation and other abatement projects would continue to have a value beyond the end of the current scheme in 2012, if agreement on a NETS is delayed.

The NSW Government would consider measures for a smooth transition to a national scheme or continuation of GGAS, as appropriate. Below is a series of subsections outlining the potential impacts of the NETS on various types of participants in GGAS.

#### *Impacts on GGAS Benchmark Participants*

GGAS places an obligation to all companies licensed to sell electricity in NSW and the ACT (electricity retailers) as well as wholesale market customers. These are all classified as mandatory Benchmark Participants. Most of these companies<sup>109</sup> do not directly emit greenhouse gases from electricity production, so their emissions would not be capped by the NETS.

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<sup>108</sup> Some sectors, such as industrial processes and fugitive emissions, are expected to be included under the cap of the NETS in the future. Until that time, abatement projects in those sectors would be eligible to create offset credits as per the rules and requirements of the NETS offsets regime.

<sup>109</sup> A small number of direct market participants are liable under GGAS (that is, Delta Electricity and Macquarie Generation). These companies own power-generation facilities with capacities of over 30 MW; these facilities would have their emissions capped under the NETS.

Benchmark Participants and their expected obligations in a transition to the NETS would be considered by the NSW Government.

*Impacts on generators in the NEM*

Under the current GGAS Rule 2—Generation, a power generator is eligible to be registered as an abatement certificate provider<sup>110</sup> if it exports electricity to a registered network connected to the NEM and its generation activity meets one of the following criteria:

1. it generates electricity at a lower emission intensity than the NSW Pool Coefficient;<sup>111</sup> or
2. it improves the efficiency of its electricity generation to provide an associated reduction in its emissions intensity.

This means that all power generators exporting to a registered network connected to the NEM (that is, the bulk of Australia's installed capacity) are potentially eligible to participate in GGAS and realise the financial value of abatement before the commencement of the NETS (possibly in 2010).

After just 3 years of GGAS operation, a significant number of generators from South Australia, Victoria and Queensland, as well as those in NSW, have become registered under GGAS and are expected to create significant numbers of abatement certificates up to at least 2012.

This situation has a double benefit for implementation of the NETS. It creates a positive incentive for generators to understand their positions with respect to greenhouse gas emissions (well before the anticipated start of the NETS), while at the same time providing a relatively accurate estimate of emissions across the power sector. This information is particularly useful in the various modelling and monitoring tasks that are yet to be undertaken by the Taskforce in further development of the detailed design of the NETS.

If the NETS commences in 2010, all power generators with capacity greater than 30 MW would be subject to the emissions cap. The permit allocation process (as described in Chapter 7) would consider the financial impact on individual generators of the transition to the NETS. One option would be for the permit allocation process to include consideration of the value of the GGAS abatement certificates that generators would have reasonably expected to have created and sold across the 3 years of overlap between the

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<sup>110</sup> See GGAS Rule 2—Generation for detailed criteria for eligibility and creation of abatement certificates (available from the GGAS website: [www.greenhousegas.nsw.gov.au](http://www.greenhousegas.nsw.gov.au) ).

<sup>111</sup> The NSW Pool Coefficient is calculated each year and is based on a 5-year rolling average of the emissions intensity of the 'must run' generating systems (hydro, base load coal) located within NSW. The current value is 0.929 t CO<sub>2</sub>-e per MWh of electricity.

current version of GGAS and the commencement of the NETS (that is, calendar years 2010, 2011 and 2012).<sup>112</sup>

Of the generators participating in GGAS before the commencement of the NETS, those with capacities of less than 30 MW would not be covered by the emissions caps. Most small electricity generators in GGAS create the majority of their abatement certificates from avoiding methane emissions (for example, landfill or sewage gas generators).<sup>113</sup> These generators would be likely to continue to be able to create offset credits under the NETS.

In general, generators that improve their emissions intensities under GGAS are likely to be better positioned to meet their liabilities under a NETS, as they would require fewer permits, as well as having gained valuable experience in the monitoring and reporting of emissions.

#### *Impact on energy-efficiency initiatives in NSW and the ACT*

A range of energy-efficiency projects are eligible under GGAS, including six types of electrical energy efficiency, fuel switching and on-site power generation projects. Proponents can use a number of methods to calculate the number of GGAS abatement certificates that can be created. Some of these methods allow certificates to be created continuously over the life of the project. Others allow certificates to be created on a one-off basis, by using default abatement factors, at the time energy-saving equipment is installed.

The NETS (as set out in this Discussion Paper) is structured in a way that potentially creates a ‘double counting’ effect if both direct emissions from power generation and electrical energy-efficiency initiatives are included in the scheme. For this reason, electrical energy-efficiency projects under GGAS are not proposed to be eligible as offsets projects under the NETS. (See Chapter 5.)

A variety of complementary measures to address energy efficiency are either being implemented or considered by all State and Territory Governments. These are discussed further in Chapter 13.

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<sup>112</sup> That is, when the difference between the forecast operating profits of a generator are estimated for the purpose of allocating permits (that is, estimation of both the ‘with the NETS’ and the ‘without the NETS’ scenarios), revenues from selling NGACs during the three 3 years of overlap would be taken into account in the ‘without the NETS’ scenario.

<sup>113</sup> This is due to the high global warming potential of methane, and the corresponding multiplier of abatement that results from combusting methane that otherwise would have been vented to the atmosphere (that is, changing it from CH<sub>4</sub> to CO<sub>2</sub>).

*Impact on GGAS projects that would be recognised as offsets projects under the NETS*

GGAS recognises a wide variety of abatement activities outside of electricity generation and consumption. These activities include the reduction of industrial process emissions, the sequestration of carbon in forests, and the combustion of waste methane emissions (that is, landfill gas, sewage gas, methane manufactured from putrescible waste, waste coalmine gas, and waste methane from industrial facilities).

As can be seen in Chapter 5, the Taskforce is proposing that a broad approach to offsets projects be established to improve the coverage and cost-effectiveness of the NETS. At the commencement of the scheme, possibly in 2010, a number of abatement activities recognised under GGAS would be eligible to become registered offsets projects under the NETS and hence create offset credits.

The impact of a transition from GGAS to the NETS for these abatement activities would be based on two issues: the volume of abatement recognised, and the value of that abatement under the two schemes.

For reductions in industrial process emissions and combustion of waste methane, the volume of abatement recognised under the NETS would depend on the offsets rules that are to be developed before the commencement of the scheme (see Chapter 5 for more details). This may differ from the volume of abatement recognised under GGAS rules. One option that could be considered is that, during the 3 years of potential overlap between the schemes (that is, 2010, 2011 and 2012), offsets projects previously registered under GGAS could use those baselines and certificate creation provisions to create offset credits under the NETS. Then, from 2013 onwards the baselines and offsets rules prescribed by the NETS would apply. Comment is sought on the implications of this approach in terms of equity, disadvantage, and market dynamics.

For carbon sequestration in forests, it is proposed that the framework developed by GGAS (in terms of Kyoto consistency, baselines and carbon accounting) be used as the starting point for forest projects under the NETS. This would provide a relatively smooth transition for forest projects in terms of volume of abatement. It is proposed that those registered already under GGAS could be automatically registered under the offsets regime of the NETS.

The value of offset credits in the early years after commencement of the NETS would be determined by a variety of factors. These include the setting of the cap, the determination of penalties, and the availability of low-cost abatement in Australia and internationally (through the acceptance of credits created through the CDM, for example). The difference between the value of offset credits and the value of GGAS abatement certificates would depend on a range of factors. This issue would be taken into account by the NSW Government in considering GGAS transitional issues.



### **11.2.6 Measurement, verification and institutional structures**

The various market-based mechanisms described in this Chapter have produced systematic and robust approaches to measurement, reporting and verification, and have prompted the development of sophisticated institutional structures to operate and regulate the schemes. These outcomes are extremely valuable for accelerating the implementation of a NETS.

It is proposed that, where possible, new measurement, verification and institutional structures should build on existing approaches (see Chapters 8 and 9 for more detail).

## **11.3 Conclusion**

There are possibly 3.5 years between the release of this Discussion Paper and the possible early commencement date for the NETS (2010). Over this period, a number of activities would need to be undertaken to provide for a smooth transition to the operation of the scheme. Before the scheme can commence, the following actions would need to be taken:

- developing and enacting legislation to support the NETS
- establishing and developing the required institutions
- commencing mandatory monitoring, reporting and verification of emissions
- designing and implementing permit allocation processes
- defining rules and procedures for offsets projects
- appropriate capacity-building and education of participants and stakeholders.

A number of existing market mechanisms must be considered in the detailed design of the NETS and in the options for harmonisation of the various schemes. Given the design of the NETS set out in this Discussion Paper (that is, coverage for caps, eligibility of offsets), it would be possible for MRET, VRET and the Queensland 13% Gas Scheme to operate in parallel with the scheme.

The NSW and ACT GGAS would overlap substantially with capped participants and offsets providers under the NETS. The NSW Government is considering means to prepare for the transition to a NETS and to facilitate an extension to GGAS in the event that agreement on the NETS is delayed.

Ultimately, it would be up to governments that operate these market mechanisms to decide and legislate on any appropriate modifications or adjustments to the schemes.

*Detailed comments are sought on the activities required for transition to the NETS and the potential to achieve the desired outcomes in the time available.*

*Detailed comments are sought on the proposed approaches to harmonisation with existing market mechanisms, and how the NETS should be designed and implemented to minimise disruptions and provide an appropriate level of certainty to facilitate investments in abatement projects.*

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## 12 Linking with international schemes

*The introduction of a national emissions trading scheme in Australia raises the possibility of linking the proposed scheme with similar schemes overseas. This Chapter discusses some of the opportunities and risks associated with linking and some of the ways in which linking could occur.*

*Any moves towards bilateral linking of schemes, across national borders or in accordance with international agreements, are more properly the role of the Commonwealth Government. However, the possibility of using international credits created under the Clean Development Mechanism (CDM) is canvassed.*

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### 12.1 Introduction

The growing recognition of emissions trading as a beneficial approach to reducing greenhouse gas emissions has prompted the development of numerous trading schemes around the world. These schemes vary greatly in their design, and range from compulsory international schemes (such as the EU ETS) to voluntary schemes (such as the Chicago Climate Exchange).

A number of potential linking scenarios are possible. It is useful to think about two different types of linking – bilateral linking of two schemes and unilateral linking of one scheme to another. Each of these is discussed below.

### 12.2 Bilateral linking

Bilateral linking involves the mutual acceptance of credits or permits between two schemes. Given the proposed design of the national emissions trading scheme and the international negotiations that would be required to establish bilateral links with other schemes, this would be an area more appropriately dealt with by the Commonwealth Government.

The basic rationale for considering bilateral linking is the same as that for introducing an emissions trading scheme. That is, an emissions trading scheme allows the overall costs of meeting a cap to be minimised by allowing firms with a high cost of abatement to purchase abatement from firms with a low cost of abatement. By increasing the scope of a domestic scheme, international linking broadens the likelihood that there will be differences in the marginal cost of abatement between firms. This increases the range of mitigation options that are available to market participants – thus the *aggregate emissions cap* of the two schemes could be met at a lower cost.

If the emissions trading schemes are functioning well then bilateral linking should result in movement towards a single permit price. Assuming the permit price was different in the two schemes prior to linking, the price in one scheme would rise and the price in the other scheme would fall. Thus the creation of a single market would create winners and losers in both schemes.<sup>114</sup>

Firms that are *net sellers* in the cheaper scheme would be better off after linking as they would receive a higher price for their ‘excess’ emissions permits. Firms that are *net buyers in the cheaper scheme* would be worse off as they would have to pay more for the permits they buy. Conversely, *net sellers in the more expensive scheme* are likely to be worse off after linking because the price they receive for their excess credits would decline. Similarly, firms that are *net buyers in the more expensive scheme* would be better off as they pay less for permits.

The extent of the price change as a result of linking would be determined, in part, by the relative size of the two markets. It is likely that a small domestic scheme (such as an Australian emissions trading scheme) linking with a large international scheme (such as the EU ETS) may only have a minimal impact on permit price in the large scheme. This is because the smaller scheme would make up a relatively small proportion of total trades. The market participants in the smaller scheme are likely to be ‘price takers’ in the combined market.

The EU ETS is perhaps the most obvious candidate for bilateral linking. However, emerging schemes (such as those under consideration in Canada and the USA) could also be considered. The EU has indicated a willingness to consider linking its emissions trading scheme with emissions trading schemes in Annex B countries such as Australia that have not yet ratified the Kyoto Protocol,<sup>115</sup> but at this stage no details on a preferred approach to linking have been released.

While the bilateral linking may reduce the cost of meeting an *aggregated* emission cap, the net result for the Australian economy is at this stage unclear. This point was raised in several submissions to the Background Paper. For example, the submission received by the Electricity Supply Association of Australia stated

Linking international trade in emissions rights should reduce the overall compliance costs for participants internationally. From this perspective, an Australian emissions trading scheme should be capable of linking with other schemes. However, whether Australian participants would benefit

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<sup>114</sup> Blyth and Bosi, *Linking Non-EU Emissions Trading Schemes with the EU Emissions Trading Scheme*, International Energy Agency report COM/ENV/EPOC/IEA/SLT (2004) 6, 2004.

<sup>115</sup> The Linking Directive states that “following entry into force of the Kyoto Protocol, the Commission should examine, whether it could be possible to conclude agreements with countries listed in Annex B to the Kyoto Protocol which have yet to ratify it, to provide for the recognition of allowances between the Community scheme and mandatory greenhouse gas emissions trading schemes capping absolute emissions established within those countries.”

from linking with other schemes, and what the optimal arrangements for trade might be, would have to be assessed in greater detail taking into consideration a range of issues once the detailed design of the scheme has been progressed. (submission 55, p.3)

The costs and benefits of bilateral linking require further empirical analysis before a definitive position can be reached on this issue. With this in mind, emphasis has been placed on designing a scheme with features that are domestically appropriate but which do not rule out linking at some future date. The Australian Financial Markets Association submission highlights that such an approach may also reduce regulatory risk for participants:

Specifically, as a small (but carbon intense) economy, to be inconsistent with international markets presents a significant regulatory risk, since over time any Australian only scheme that was fundamentally incompatible with global norms would appear likely to be changed or revoked.

This does not mean that an Australian design needs to blindly follow overseas leads, and cannot be tailored to Australian conditions. Rather it means that Australian developments should be conducted with a view to ensuring that later transitions to ever broader and wider markets can be achieved with a minimum of redesign. (submission.51. p.8)

*It is proposed that bilateral linking is an option that could be explored at a subsequent stage in the scheme's development. In any event, this issue would be more appropriately dealt with by the Commonwealth Government.*

### 12.3 Influence of design features on future bilateral linking.

To understand the impact that the proposed design features may have on the potential for bilateral linking, the Taskforce has reviewed the relevant literature and commissioned work by an expert international consultant.<sup>116</sup> The general conclusion from this analysis is that bilateral linking of emissions trading schemes is technically possible between schemes with divergent designs, but linking schemes is easier if the designs are similar.

Some of the main design features and the practical issues that these features raise for bilateral linking are discussed below. Because bilateral linking with any specific scheme is not proposed at this stage, a general overview is provided rather than specific commentary on the requirements for linking with any specific overseas market.

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<sup>116</sup> Erik Haites, 2006, *Possible Use of Kyoto Credits in a National Emissions Trading Scheme*, Report prepared for the Taskforce by Margaree Consultants Ltd.

**Legitimacy of the trading unit:** A prerequisite for trade in any commodity is that both parties recognise the value of the item being traded. This means that the permits or credits being traded in each scheme must be recognised as representing a legitimate reduction in CO<sub>2</sub> emissions that can be credited towards their respective emissions trading scheme caps. The International Energy Agency has identified a number of conditions that are typically required for legitimacy of trading units between schemes to be recognised. These are:<sup>117</sup>

- If possible, the unit should represent the same quantity throughout the schemes that is, 1 tonne of CO<sub>2</sub>-e = 1 tonne of CO<sub>2</sub>-e no matter where it originates or how it is created.
- The rules of the scheme must be stable. That is, the property rights surrounding the permit or credit must be secure.
- The implications for non-compliance must be well defined. That is, the monitoring and enforcement regime must be clear.
- Emission levels must be verifiable using transparent methodologies for measurement and reporting. That is, participants may require assurance that the credits they are purchasing are created using, say, accurate inventories.
- Firms must only be allowed to surrender permits once.
- The process for allocating permits should be transparent and predictable, and the system for tracking transactions should be efficient and secure.

**Coverage:** The cost of reducing greenhouse gas emissions will differ between industries. This means that decisions about which industries are covered under the scheme will influence the market price of permits. While coverage will affect the relative price prevailing in the two schemes, it is not in itself a design feature that will pose any particular structural impediments to future linking. All things being equal, variations in permit prices will only influence the distribution of gains from trade and not the efficiency of the market *per se*. Of course, differences in coverage may raise some important political and equity issues.

**Stringency of the cap:** The level of emissions reductions implied by the cap will have a significant impact on the price at which permits trade in the market. However, as with coverage, this will have little impact on whether or not linking is technically possible. The exception to this is when the cap in one of the schemes is set above the business as usual

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<sup>117</sup> International Energy Agency, *Act Locally, Trade Globally*, 2005, p.125.

scenario. In this case the overall emissions in the combined schemes would be higher than if the scheme were kept separate – reducing environmental integrity.<sup>118</sup> Again, the stringency of the cap may raise some political and equity considerations.

**Banking:** If one scheme allows banking and the other does not, then firms in the scheme that does not allow banking would effectively be able to bank anyway. They would do this by developing contracts with firms in the scheme in which banking is allowed. These contracts may not lead to any company-level distortions but would lead to a concentration of banking in one of the schemes<sup>119</sup>. The banking of permits is therefore one design element that may require some level of harmonisation prior to linking.

**Monitoring, reporting and verification:** As mentioned, a prerequisite for linking is that both schemes recognise the legitimate value of the permits being supplied to the market. Confidence in this value can be undermined if the monitoring, reporting and verification process in one of the schemes is not perceived as being robust. The standardisation of these processes via the development of international protocols and methodologies will assist in promoting international recognition. Examples of such standards include the IPCC good practice guidelines, ISO 14064 and *The Greenhouse Gas Protocol* (WBCSD/WRI, 2001).

**Penalties and make-good provisions:** Whether or not differences in the level of penalty imposed for non-compliance create technical issues for linking will largely be determined by the presence or absence of a make-good provision. If a make-good provision is in place, firms that do not meet their obligations in one compliance period must pay a penalty and ‘make good’ any shortfall in a future compliance period. Thus the price of permits in the market is independent of the penalty level. In contrast, if no make-good provision is in place then the penalty effectively becomes a cap on the price of permits. This is because once the price of permits reaches the penalty level, firms can simply pay the penalty and be released from any further obligations in regards to any excess emissions.

Linking schemes that have different penalty levels but which both have make-good provisions is relatively straightforward (as long as the penalty levels were high enough to encourage compliance). However, linking a scheme with a make-good provision with one that does not would be problematic. If the price of permits was above the penalty level in the scheme with no make-good provision, firms would have an incentive to sell permits (at a profit) to the scheme with a make-good provision – thus encouraging non-compliance.

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<sup>118</sup> Blyth and Bosi, *Linking Non-EU Emissions Trading Schemes with the EU Emissions Trading Scheme*, International Energy Agency report COM/ENV/EPOC/IEA/SLT(2004)6, 2004.

<sup>119</sup> Ibid.

While this issue may be able to be overcome, these are likely to increase the administrative cost of the schemes and reduce the overall efficiency of the combined market.<sup>120</sup>

**Allocation:** While the method with which permits are *initially* allocated has a significant impact on the distribution of wealth, in theory it should have little impact on the final location of permits (that is, once trading has occurred). As such, differences in the methods used to initially allocate permits should not pose a technical barrier to linking. This is demonstrated by the European Union emissions trading scheme which leaves the detail of allocation to Member States.

In summary, mutual recognition of permits is a prerequisite for bilateral linking of emissions trading schemes. This will be influenced by factors such as the stability of the trading rules and confidence in the accuracy of the emissions inventory in each scheme. The currency being traded (e.g. tonnes of CO<sub>2</sub>-e), approaches to monitoring, reporting and verification, the penalty regime and banking provisions typically require the greatest degree of harmonisation. Differences in the severity of the cap and the sectors covered by the scheme may raise equity and political issues but do not pose any specific technical barriers to linking. The method of allocation should also have little impact on the ability to link schemes.

### **12.3.1 Unilateral linking**

An alternative approach to bilateral linking would be for the domestic scheme in Australia to link unilaterally with overseas schemes. This would allow firms in Australia to purchase permits from other schemes around the world and use them to meet their obligations under the domestic scheme. There would be no necessity for the overseas schemes to recognise permits created under the Australian scheme. The two markets would remain separate and a single permit price would not necessarily emerge.

In contrast to bilateral linking, unilateral linking provides an additional ‘safety valve’ for the permit price in the domestic market. If the price of domestic permits is less than the price of international permits, firms would not use international permits to meet their obligations under the emissions trading scheme. If the price of domestic permits reaches the price of the international permits, liable entities would buy international permits—thus the price paid by firms in Australia could not exceed the price of international permits.

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<sup>120</sup> For a discussion of possible technical solution to this issue see Blyth and Bosi, *Linking Non-EU Emissions Trading Schemes with the EU Emissions Trading Scheme*, International Energy Agency report COM/ENV/EPOC/IEA/SLT(2004)6, 2004.



Sustainable Solutions submitted that such an approach may be useful in the initial phase of the scheme:

... a 'one way' approach could be applied, where permits from other schemes (that meet minimum criteria) could be surrendered for compliance with Australian obligations, but permits generated in Australia could not be exported: this would help reduce compliance costs in Australia. ... Such an approach could probably not be maintained for a long period, but could be a useful phase-in mechanism. (submission 1. p. 3)

The Kyoto Protocol establishes several different types of credits that Annex B parties can use to meet their commitments. These include:

- Certified Emissions Reductions (or CERs)<sup>121</sup> created under the Clean Development Mechanism.
- Assigned Amount Units (AAUs) which, in total, represent the amount of greenhouse gas that each Annex B country is allowed to emit during the first commitment period of the Kyoto Protocol.<sup>122</sup>
- Emission Reduction Units (ERUs) created under the Joint Implementation mechanisms.
- Removal Units (RMUs) issued for increased stocks of carbon in forests or agricultural soils in Annex B parties.

From an environmental perspective, an emission of 1 t CO<sub>2</sub>-e by a liable entity under the national emissions trading scheme could be offset by a 'Kyoto credit' or an EU emissions trading scheme credit that represents a permanent reduction of 1 t CO<sub>2</sub>-e.

Permanent emission reductions achieved by CDM projects (CERs) meet this test as the emission reductions are independently verified through an international process. ERUs may also meet this test; however, processes and methodologies for these projects are still emerging. AAUs may not meet this test because some parties have allocations in excess of their projected emissions.<sup>123</sup> Similarly, Removal Units (RMUs) issued for increased stocks of carbon in forests or agricultural soils in Annex B parties may not meet the test because they rely on the commitment of the host country to maintain the stock (and may therefore be temporary).

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<sup>121</sup> For afforestation and reforestation projects credits are created that expire either at the end of the next compliance period (tCERS) or at the end of the project accrediting period (ICERS). Permanent reductions are simply referred to as CERs.

<sup>122</sup> An Assigned Amount Unit is a tradable unit of 1 t CO<sub>2</sub>-e.

<sup>123</sup> The term 'greened AAUs' is sometimes used. This refers to a sale of AAUs with the proceeds being used to fund emission reduction activities. They are commitments of future emission reductions.

The Australian scheme could unilaterally link to the EU ETS without any technical problems since EU allowances would be tagged as AAUs. Therefore, cancelling an EU allowance would technically correspond with cancelling an AAU. However, further discussion with the European Commission would be needed to determine if such a unilateral link would be politically acceptable, since it might increase the compliance costs for EU installations.

As discussed in Chapter 5, it is proposed that liable firms in Australia be permitted to exchange credits created under the CDM (that is, CERs) for offset credits under the national emissions trading scheme. Current indications are that at least 1.25 billion CERs will be generated by the end of 2012 and that the price will be in the range of €10 to €15 per CER or approximately A\$17 to A\$25.<sup>124</sup>

Using CERs from the CDM in this way would require the Scheme Regulator to establish an account in the national registry of an Annex B party to the Kyoto Protocol.<sup>125</sup> Liable entities that wish to surrender CERs towards their obligations under the cap would transfer their credits to this account. The Scheme Regulator would then transfer the credits to the appropriate cancellation account in the Annex B party's registry, which means they could not be resold or used for compliance with Kyoto protocol commitments,<sup>126</sup> thus avoiding double counting issues. An identical number of offset credits would then be created in the liable entity's account in the national emissions trading scheme's registry.

The EU ETS places some restrictions on the types of CDM credits which might be used by liable companies for compliance. Sequestration projects for both JI and CDM are excluded so far because of liability issues resulting from the temporary character of the associated credits. In addition, abatement from nuclear facilities is exempted, which is in line with the intent of the Marrakech Accords.<sup>127</sup> In addition, the EU Member States impose limits on the use of the Kyoto Mechanism for companies under the EU ETS.<sup>128</sup> The reason for these limits is based on the complementarity requirement which ensures that despite the flexible

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<sup>124</sup> Erik Haites, 2006, *Possible Use of Kyoto Credits in a National Emissions Trading Scheme*, Report prepared for the Taskforce by Margaree Consultants Ltd..

<sup>125</sup> An Annex B party is a country that has ratified the Kyoto Protocol and has an emissions limitation commitment for 2008–12. Examples are New Zealand, UK, Netherlands, etc.

<sup>126</sup> The registry account could also be managed for the Scheme Regulator by a trustee, such as a solicitor, or an agent, such as a broker. Subject to stakeholder feedback, the best way to establish and operate the registry account could be investigated in greater detail in the next phase of the NETS development.

<sup>127</sup> The Marrakech Accords state: 'Recognizing that Parties included in Annex I are to refrain from using certified emission reductions generated from nuclear facilities to meet their commitments under Article 3, paragraph 1.' Decision 17/CP.7, FCCC/CP/2001/13/Add.2.

<sup>128</sup> The limits will be included in the National Allocation Plans for the period 2008–12. Germany for example, has published a limit of 12% based on the allocation of the installation.

mechanisms a significant part of the target will be fulfilled by domestic action. This principle is laid down in the Kyoto Protocol and has been restated in the Marrakech Accords.<sup>129</sup>

It is proposed that CERs be recognised as offset credits under the national emissions trading scheme. Comment is sought whether some form of limit should be placed on the volume of CERs that would be recognised and what form that limit should take.

There are a number of benefits from unilaterally linking to the CDM. These include:

- incorporating Australia into an international carbon market, despite Australia's non-ratification of the Kyoto Protocol
- helping to facilitate the transfer of technology from developed to developing countries in a sustainable way
- minimising overall transaction costs. Australia needs no additional accreditation infrastructure to recognise those credits—international administrative mechanisms are already in place
- raising the profile of CDM and JI activities in Australia. A small number of Australian companies are already active in that market, although there is probably scope for greater involvement. Australia's non-ratification presents relatively minor barriers to participation in this market.

*It is proposed that unilateral linking with the CDM be achieved by recognising CERs as equivalent to offset credits under the NETS. This would allow firms to use CERs to meet their obligations under the scheme. CERs would be cancelled in the respective registry of origin to ensure that reductions are not counted twice.*

*Comments are sought on:*

- *whether there are any categories of CDM projects that should be excluded from acceptance under the Australian emissions trading scheme or if other limits should be placed on the volume of CERs recognised in a particular period;*
- *and whether some form of limit should be placed on the volume of CERs that would be recognised and what form that limit should take.*

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<sup>129</sup> 'The use of the mechanisms [International Emissions Trading, CDM, JI] shall be supplemental to domestic action and that domestic action shall thus constitute a significant effort made by each Party included in Annex I to meet its quantified emission limitation and reduction commitments under Article 3, Paragraph 1.' (Article 1 Draft Decision -/CMP.1 (Mechanisms) contained in Decision 15/CP.7, Marrakech Accords).

## **12.4 Conclusion**

Bilateral linking *may* be desirable in the longer term, but the principal objective of designing the NETS should be to establish a strong domestic market that is suitable for Australian needs.

An analysis of the impact of specific design features on the possibility of future bilateral linking has shown that it is technically feasible to link schemes with different designs as long as some basic conditions are met (such as the mutual recognition of the trading unit). However, bilateral linking should only be considered after extensive assessment of the cost and benefits of doing so, and is more appropriately dealt with by the Commonwealth Government.

Unilateral linking with the CDM is canvassed. This would allow firms to convert CERs to offset credits under the NETS while preventing double counting of the reductions. This approach has the advantage of incorporating Australia into the international carbon market while providing an additional 'safety valve' for prices of domestic offset credits and permits. Comment is sought on whether any limits on the types or volumes of credits should apply.

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## 13 Complementary measures

*Emissions trading is likely to form an important part of the greenhouse response of Australian Governments. However, it will be only one element in a range of programs of action that will include regulatory, fiscal and voluntary measures to achieve emissions abatement across the economy. This Chapter outlines some of the measures being undertaken, or that will need to be undertaken, to complement a NETS.*

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### 13.1 The need for complementary measures

The scheme design set out in this Discussion Paper would form part of a broader suite of programs designed to reduce greenhouse gas emissions. Emissions trading would not be a 'silver bullet' that could alone solve all emissions concerns. Additional policies, and how they would complement emissions trading, are set out in this Chapter.

Private sector initiatives are also important. These include private investments in research and development for new low emissions or energy efficiency technologies, as well as voluntary decisions to reduce emissions. While acknowledging the significant contribution that such private initiatives are making, this Chapter focuses primarily on complementary government policy measures.

Submissions to the Background Paper expressed varying views on complementary measures to an emissions trading scheme. Many respondents considered that the coverage of the emissions trading scheme should be broader than the stationary energy sector. For example, the Energy Retailers Association of Australia wrote that:

A NETS must cover all sectors of the economy including (but not limited to) energy, transportation and agriculture. A sectoral approach that discriminates between sectors, especially in terms of implementation, would be distortionary. (submission 44, p. 5)

In contrast, the NSW Electricity Generators wrote:

It is imperative that emitting sectors that do not participate in a NET scheme are dealt with by other appropriate regulatory measures to reduce emissions. Otherwise these sectors will effectively be subsidised, imposing a tariff on the one sector participating in the NET scheme. (submission 42, p. 8)

Several submissions have highlighted the fact that an emissions trading scheme forms only one element of a comprehensive strategy to reduce greenhouse gas emissions. For example, the Australian Petroleum Production and Exploration Association argued:

There is no single policy, or silver bullet, that can provide the projected deep cuts to emissions needed to effect stabilisation or reduction of atmospheric concentrations of CO<sub>2</sub>. Rather, a suite of measures including energy efficiency, cost-effective fuel switching and technology change will be required. (submission 62, p. 1)

There are many reasons why government intervention is required to reduce greenhouse gas emissions. An emissions trading scheme addresses one of these reasons—to ensure that investment, production and consumption decisions in the stationary energy sector internalise the costs associated with greenhouse gas emissions.

However, applying a price to greenhouse emissions is only part of the story. Major changes in technologies and behaviour are required across the economy. There are many non-price barriers to abatement, as well as the need for a significant research and development effort.

### **13.2 Strategies to implement complementary measures**

The Commonwealth Government and the State and Territory Governments are implementing, or have committed themselves to implement, a wide range of measures across all sectors to reduce greenhouse gas emissions. Further information on these can be obtained from the AGO or can be found in State and Territory greenhouse plans and strategies.

The NETS set out in this Discussion Paper should be seen in this context. Emissions trading is likely to form an important part of the greenhouse response of Australian governments. However, it will be only one element in a range of programs of action that will include regulatory, fiscal and voluntary measures to achieve emissions abatement across the economy.

As such, a range of complementary measures operating alongside an emissions trading scheme will be needed for the foreseeable future. In particular, complementary measures are essential in the following areas where the likely effectiveness of a NETS is limited:

- **International negotiations:** Australia acting alone cannot affect the rate of climate change. Australia must contribute effectively in international negotiations, and through international programs, to help bring about emission reductions in high-emitting and/or rapidly-growing countries, as well as by reducing emissions domestically.
- **Research, development and demonstration:** In all major emitting sectors, new technologies will be needed to achieve emissions abatement—Australia will need to engage in international collaboration (for example, via the Asia-Pacific Partnership), as well as to carry out ongoing research and development in high-emitting domestic sectors such as energy and agriculture.
- **Areas where a NETS is not possible or transactions costs are likely to exceed possible benefits:** For example, Commonwealth and State chemical handling regulations already control emissions of hydrofluorocarbons or sulphur

hexafluoride. Emissions of these gases tend to be accidental. Coverage of such emissions would be expensive compared with the likely reductions that this added incentive to avoid emissions would induce.

- **Areas where non-price barriers predominate:** For example, in the field of energy efficiency, there are well-documented cases where the financial incentives faced by different groups (such as landlords and tenants, or builders and purchasers) might not be well aligned, at least in the short term.
- **Areas where there are significant price inelasticities (of supply or demand):** For example, transport emissions appear fairly insensitive to petrol prices in the short term. The increase in the cost of unleaded petrol from around \$0.90/L to \$1.35/L since the beginning of 2004<sup>130</sup> has been equivalent to an emissions price of \$180/t CO<sub>2</sub>-e.<sup>131</sup> Although there is some evidence that price increases of this magnitude are affecting demand,<sup>132</sup> smaller price rises (commensurate with the much lower emissions prices that are expected under the emissions trading scheme) would be unlikely to have a significant impact on demand, at least in the short term.

Complementary measures have been established and implemented under State and Territory greenhouse plans and strategies and under the programs of the AGO.

Those plans and strategies, along with Australia's Fourth National Communication<sup>133</sup> under the UNFCCC, summarise measures that all Australian governments are implementing. These measures are outlined in the following sections under three broad headings:

- measures applying to sectors covered by a NETS
- measures applying to other sectors
- international engagement.

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<sup>130</sup> Source: <http://www.aaa.asn.au/petrol/ULP.pdf>: data on unleaded petrol prices across capital cities since 1998, compiled for the Australian Automobile Association by FUELtrac. Prices in Tasmania and the Northern Territory are generally higher than those shown here, and those in Queensland are lower.

<sup>131</sup> Based on emissions of 2.5 t CO<sub>2</sub>-e per kilolitre of petrol, sourced from Australian Greenhouse Office 2005; *AGO Factors and Methods Workbook*. Department of Environment and Heritage, Canberra.

<sup>132</sup> For example, shifts to smaller vehicles and falls in fuel sales volumes: see Federal Chamber of Automotive Industries, *Car Market Turns Down as Petrol Prices Bite*, press release 3 May 2006; and ANZ Bank 2005, *Trends in Household Spending*. Presentation, December.

<sup>133</sup> AGO 2005, *Australia's Fourth National Communication on Climate Change*. Department of Environment and Heritage, Canberra

### **13.3 Complementary measures applying to covered sectors**

#### **13.3.1 Research, development and demonstration (RD&D)**

Research into, and development and demonstration of, new low-emission and zero-emissions technologies is an essential complement to emissions trading in the covered sectors, and also to measures taken to reduce emissions from the non-covered sectors.

Regardless of their view of emissions trading, most respondents to the Background Paper considered that research and development into low-emission technologies was a key priority. For example, the Australian Conservation Foundation wrote:

... emissions trading can only deliver within a sound comprehensive policy framework. ACF supports a long-term multifaceted policy and technology response to climate change. Such an approach must ensure the immediate deployment of existing renewable energy technologies and energy efficiency, and stimulate research, development and demonstration of new zero and near zero emission technologies. (submission 50, p. 4)

The Australian Industry Greenhouse Network wrote:

Policies needed to address climate change in any substantial way must focus on inducing innovation and technological change, most likely involving a combination of efforts on improved patent rights, government grants and tax incentives to lever private sector capital, rewards for discoveries and demonstration, and the exploitation of opportunities to grow resources devoted to R&D under consortia of complementary industries like coal and power. Government research bodies have an important role in this challenge. (submission 47, p. 8)

States and Territory Governments agree. The research and development effort must be complemented by efficient and effective demonstration, commercialisation and deployment processes, and effective international technology transfer. Public funding will be necessary to support the early stages of the innovation pathways involved. Queensland has committed over \$300 million and Victoria around \$80 million to technology-related RD&D.

Although an emissions trading scheme is no substitute for an effective RD&D program, it is a valuable complement to it. Once developed, such a scheme can help ensure that new technologies are deployed.

At the same time, an effective RD&D program is no substitute for a carbon price signal, and is unlikely to be as efficient or effective as market mechanisms at the deployment stage. Point Carbon in its 2006 report concluded that:

Technology based alternatives to the Kyoto Protocol are expected to be pushed forwards as viable options for the future international climate cooperation. However, we do not find there to be much substance in these plans. For an agreement to work it is essential that there is a price on carbon, and a



value on reductions, thus incentivising private sector investments in new technologies. Currently, the carbon market remains the best option for enabling the transfer to a less carbon-intensive global economy.<sup>134</sup>

Delaying price signals until such time that low emissions technologies are commercially viable also implies a delayed start to making emissions reductions. The IEA stated in this regard that:

... delaying action until [low emission technology] prices are competitive may lead to unacceptably high CO<sub>2</sub> atmospheric concentration levels. Pricing carbon emissions (directly or indirectly, for example, through quantified objectives) would expand markets for existing and forthcoming carbon-free technologies and accelerate their deployment.<sup>135</sup>

#### *Asia-Pacific Partnership on Clean Development and Climate*

The Asia-Pacific Partnership on Clean Development and Climate (AP6) is a collaborative effort between the governments of Australia, China, India, South Korea, Japan and the US to enhance the rate of development of emissions-reducing technologies. The objectives of the Partnership are to:

- develop, deploy and transfer existing and emerging clean technology
- meet increased energy needs and explore ways to reduce the greenhouse gas intensity of economies
- build human and institutional capacity to strengthen cooperative efforts
- seek ways to engage the private sector.

The Partnership's inaugural Ministerial meeting in January 2006 in Sydney established eight government and business taskforces, on: (1) cleaner fossil energy; (2) renewable energy and distributed generation; (3) power generation and transmission; (4) steel; (5) aluminium; (6) cement; (7) coal mining; and (8) buildings and appliances.<sup>136</sup> The Partnership does not currently envisage taskforces for transport, agriculture, waste or land use, land-use change and forestry (LULUCF) emissions. Australia has committed \$20 million a year to this over the five years 2006–10.

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<sup>134</sup> Point Carbon 2006, *Carbon 2006*. Hasselknippe H and Røine K eds. 60 pp

<sup>135</sup> Justus D, Philibert C 2005, *International Energy Technology Collaboration and Climate Change Mitigation. Synthesis Report*, IEA, November

<sup>136</sup> Department of Foreign Affairs and Trade, 18 April 2006, [www.dfat.gov.au/environment/climate/ap6](http://www.dfat.gov.au/environment/climate/ap6),

*Commonwealth RD&D programs*

The Commonwealth Government operates several RD&D funding programs:

- Low Emissions Technology Demonstration Fund (\$500 million over 15 years)
- Low Emissions Technology and Abatement Fund (\$26.9 million)
- Renewable Energy Development Initiative (\$100 million over 7 years)
- Solar Cities (\$75 million).

Implementation of these programs is supported by all governments and by industry stakeholders.

*State and Territory RD&D programs*

State and Territory Governments fully support the RD&D efforts of the Commonwealth, and in the last year they have committed almost \$400 million to complement the Commonwealth's programs and to fund additional research and development actions in their own jurisdictions. These include:

- The Queensland Future Growth Fund, under which the Queensland Government is allocating \$300 million towards clean coal technology to complement the Commonwealth Government Low Emission Technology Demonstration Fund and industry funding under COAL21.<sup>137</sup>
- Victorian Energy Technology Innovation Strategy (\$83.5 million), established by the Victorian Government to support the development of technologies that will maximise the ability to reduce emissions in the long term.
- NSW Climate Action Grants (\$10 million), to foster innovation and research into reducing emissions from waste, agriculture, land use, industrial processes and transport.
- Support for the Centre for Low Emissions Technology in Queensland and Cooperative Research Centres (CRCs) such as the CRC for Greenhouse Gas Technologies, the CRC for Coal in Sustainable Development, and the CRC for Beef Genetic Technologies.

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<sup>137</sup> The Australian black coal mining industry has committed to provide up to \$300m to the 'COAL21 Fund' over the next 5 years. The industry will work with the electricity generation industry to demonstrate technologies for reducing greenhouse gas emissions from coal-fired power stations. (COAL21 News, Issue 8, March/April 2006.)

### **13.3.2 Energy-efficiency programs**

State and Territory Governments have a range of measures in place to promote energy efficiency. Some of these measures are developed and implemented jointly through the National Framework on Energy Efficiency, whereas others are pursued independently. These measures address a range of non-price barriers to energy efficiency, and so would play a complementary role to emissions trading. Respondents to the Background Paper were generally supportive of energy-efficiency measures. The Australian Industry Greenhouse Network wrote:

In the broad, AIGN members are of the view that further government measures to curtail Australian GHG emissions should ... include some regulatory measures in the area of labelling and standards. (submission 47, p.3)

WWF wrote:

[An emissions trading scheme] needs to be part of an overall policy response to reduce emissions and fundamentally restructure Australia's energy and transportation sectors. This response needs to include a range of measures and cover all sectors including by ... implementation of robust residential, commercial and industrial energy efficiency programs with appropriate funding to support them. (submission 41, p.4)

The Energy Retailers Association of Australia took a more cautious view:

Energy efficiency is not strictly a climate change policy issue per se primarily because it will occur as a result of higher carbon charge. Additional improvement may come from regulation of market failure, but beyond this, inducement for greater gains would represent net cost (and should not therefore be encouraged). The recent Productivity Commission Final Report, 'The Private Cost Effectiveness of Improving Energy Efficiency' supports this distinction. (submission 44, p.11)

The main measures to promote energy efficiency are summarised below.

#### *National Framework on Energy Efficiency*

The National Framework on Energy Efficiency is a two-stage program operated jointly by the Commonwealth, State and Territory Governments. Stage One is currently being implemented. Actions include:

- minimum energy performance standards for a range of appliances and devices, including a range of gas appliances
- mandatory energy performance labelling for some appliances
- energy-efficiency standards for residential and commercial buildings, and mandatory disclosure
- capacity-building and trade and professional training
- awareness-raising in the finance sector.

Stage Two of the NFEE is yet to be developed.

*Other energy-efficiency programs*

State and Territory Governments operate a range of energy-efficiency programs to overcome non-price barriers in the energy-efficiency field. Some of these are:

- mandatory Five-Star ratings for new housing (individual implementation under NFEE)
- mandatory energy-efficiency standards for commercial buildings (individual implementation under NFEE)
- mandatory disclosure of house energy rating at point-of-sale in the ACT and under consideration in other jurisdictions (NFEE)
- government energy management programs in all jurisdictions
- the Queensland Sustainable Energy Innovation Fund, to assist Queensland organisations to commercialise new products or technologies that are substantially more energy efficient than existing products or technologies; to use renewable energy sources; and/or to reduce pollution resulting from using fossil fuels
- the Victorian Energy Efficiency Action Plan, to build on existing measures and initiate new policies and programs to drive substantial improvements in energy efficiency in Victoria
- the Victorian State Environment Protection Policy (Air Quality Management), which requires EPA licensees in Victoria to undertake a mandatory energy audit and implement cost-effective energy-efficiency measures (up to 3 year payback) identified in the audit. Victoria has reported that this measure will deliver emissions savings of 1.1 Mt of CO<sub>2</sub>-e a year on an ongoing basis, with an average 17-month payback period and a large positive net present value to licensees.<sup>138</sup>
- the Victorian Business Energy Innovation Initiative, which supports Victorian businesses to identify, design and implement energy-efficiency technologies that are internationally ‘cutting edge’
- the NSW mandatory energy savings requirement under the Building Sustainability Index (BASIX) program, which requires all new residential developments in metropolitan Sydney to cut energy consumption by 25% compared with the Sydney average in 2004

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<sup>138</sup> These include emissions reductions and financial gains to businesses that have previously voluntarily identified abatement options under the Greenhouse Challenge program.

- the NSW Energy Administration Amendment (Water and Savings) Act 2005, which:
  - requires large energy-using companies, government agencies and councils to prepare mandatory **energy savings actions plans** that identify cost-effective energy-efficiency measures
  - establishes a \$200 million **Energy Savings Fund** to fund energy savings measures by large users, government and the residential sector over 5 years.

In addition, the Commonwealth *Energy Efficiency Opportunities Act 2005* requires large energy users to undertake mandatory energy audits, although it does not require mandatory implementation.

### 13.3.3 Renewable / low emissions energy deployment

The Commonwealth MRET, the NSW and ACT GGAS, the Queensland 13% Gas Scheme and the VRET scheme were discussed in Chapter 11. Outside those schemes, further support for the deployment of renewable and low-emissions energy arises from:

- Commonwealth Government programs:
  - Renewable Energy Development Initiative
  - Solar Cities
  - advanced energy storage technologies
  - elements of Greenhouse Challenge Plus and the Greenhouse Gas Abatement Program
- the National Green Power Accreditation Program (joint program by NSW, Victoria, Queensland, SA, WA and the ACT)
- the Victorian Renewable Energy Action Plan, which aims to increase the production and consumption of renewable energy in Victoria
- actions to support the South Australian Strategic Plan Target of 15% renewable energy in SA by 2015, such as solar heating systems, wind and geothermal electricity generation, and investigation of biomass power stations and biofuels
- the Western Australian target for 6% of electricity in the SWIS to come from renewable sources by 2010
- development of a Renewable Energy Strategy for Western Australia, including a target for 2020

- renewable/green power energy purchase by State and Territory Government agencies in Tasmania (100%), the ACT (23%), Victoria (10%), NSW (6%), WA (5%), and Queensland (5%)
- development of proposals for a default 10% Green Power retail electricity tariff in NSW for all new or moving residential customers
- mandatory solar hot water systems for new homes in South Australia
- the WA Solar Water Heater Rebate Program; rebates of up to \$700 are available to gas-boosted solar water heaters installed in residential properties.

## **13.4 Measures applying to sectors outside the emissions trading scheme**

### **13.4.1 Transport**

The AGO projects that transport emissions will rise from 79 Mt of CO<sub>2</sub>-e in 2003 to 94 Mt by 2010, but estimates that all existing programs combined will achieve only 2.2 Mt of abatement by 2010.

Whereas fuel and vehicle technologies and emissions standards are the responsibility of the Commonwealth Government, the State and Territory Governments have influence over transport emissions through planning for land use and urban form; transport strategies (including public transport); provision of policy signals to influence behaviour (including incentive schemes); and performance of demonstration activities and trials. Measures undertaken by the Commonwealth Government and State and Territory Governments are listed below:

- the Environmental Strategy for the Motor Vehicle Industry, established by the Commonwealth Government. The strategy includes the Green Vehicle Guide, mandatory fuel consumption labelling, and a voluntary national CO<sub>2</sub> emissions target agreed on with Australian vehicle manufacturers
- alternative fuels programs. These include the Commonwealth Government's alternative fuels conversion and infrastructure programs; and State and Territory programs such as the WA hydrogen bus trial, the NSW Ferries biodiesel trial, and a commitment to the operation of compressed natural gas-fuelled public buses in NSW and SA.
- measures by Commonwealth, State and Territory Governments to encourage biofuels. Examples include the Commonwealth's 350 ML biofuels target; a biofuels capital grants program; and biofuels production subsidies.

- information tools to encourage the use and development of vehicles that have better emissions performance than the current design standards. Examples are the Commonwealth Green Vehicle Guide and the NSW Clean Car Benchmarks.
- State and Territory programs:
  - TravelSmart programs in most mainland States and Territories
  - government fleet emissions reduction programs in most States and Territories
  - replacement of diesel buses with compressed natural gas-fuelled buses
  - WA ‘green licensing’ and development of the NSW ‘Voluntary Green Registration’ scheme, which will either fund, or be linked to, carbon sequestration activities
  - integrated land-use and transport planning strategies, public transport strategies, and freight strategies
  - promotion of cycling and walking and public provision of cycle infrastructure
  - consideration of differential registration or stamp duty fees for high environmentally performing versus low performing vehicles (ACT, NSW).

### **13.4.2 Industrial process emissions**

Industrial process emissions refer to both emissions of synthetic gases and emissions of carbon dioxide as a result of non-combustion processes within industry, such as reduction of iron ore, calcination in cement and lime manufacture, and anode reduction in aluminium smelting.

Emissions from this sector are currently relatively small but are projected to grow rapidly to 2020. AGO projections are that industrial process emissions will increase to 153% of their 1990 level by 2010 and 175% by 2020, a projected rate of growth marginally higher than that of stationary energy and second only to transport emissions. Current capacity to abate industrial process emissions is limited, and achieving reductions in these emissions is likely to require a significant research and development effort. Measures in this field include:

- regulatory approaches for management of perfluorocarbons, hydrofluorocarbons and sulphur hexafluoride
- voluntary Commonwealth programs, such as Greenhouse Challenge Plus
- elements of the Victorian State Environmental Protection Policy (Air Quality Management).

Research and development efforts will be particularly important for reducing industrial process emissions, and significant work is going on in a number of areas. As an example, the box below illustrates research being carried out in the iron and steel industry.

**Research in the international iron and steel industry**

In Europe, the iron and steel industry and European governments are collaborating on the ULCOS<sup>139</sup> initiative, which aims to reduce emissions from steelmaking by 50% by 2030. The ULCOS initiative is currently pursuing nine broad pathways to achieving this reduction, and will narrow this down to one or two 'breakthrough' technologies for further development in 2009. It is intended that a 5-year pilot phase will follow, and then a 10- to 15-year period of steady commercialisation.

The International Iron and Steel Institute (IISI) is operating a **CO<sub>2</sub> Breakthrough Program**, consisting of a number of research and development efforts in different parts of the world.

Australia's steelmakers are taking part in the IISI CO<sub>2</sub> Breakthrough Program and are represented on the Steel working group of the Asia-Pacific Partnership on Clean Development and Climate.

### 13.4.3 Agriculture

Agricultural emissions of methane and nitrous oxide currently form a large proportion of Australia's National Greenhouse Gas Inventory (16% of total emissions in 2004) but are growing relatively slowly. However, in order to achieve around a 60% reduction in emissions by the middle of this century, agricultural emissions would need to be addressed at some point. Achieving emissions reductions in agriculture will require a significant RD&D effort. Measures in this sector include:

- National Agriculture and Climate Change Action Plan (all Governments), focused on best management practices for methane and nitrous oxide in agriculture, research into methane and nitrous oxide mitigation, soil carbon storage, and bioenergy production
- Greenhouse Action in Regional Australia (Commonwealth Government)
- research into and implementation of new savanna fire management regimes (NT)
- national research into the effect of feed quality, feed additives and chemical inhibitors on methane emissions (WA)
- provision and promotion of information on emissions-reducing agricultural management practices (WA)

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<sup>139</sup> Ultra-Low CO<sub>2</sub> Steelmaking



- facilitation of access to markets related to salinity reduction, biodiversity enhancement and carbon sequestration, and promotion of projects that will provide multiple environmental benefits (SA)
- preliminary rumen ecology research through the Queensland Beef Industry Institute into reducing animal methane emissions (Qld).

#### 13.4.4 Waste

Greenhouse gas emissions from waste are projected to fall by 7% from 1990 to 2010, and by 45% from 1990 to 2020. This is primarily a result of State and Territory waste strategies and requirements for landfill gas controls to be applied at landfills. Existing strategies for waste are therefore projected to be relatively effective for control of greenhouse gas emissions. Measures in this sector include:

- waste reduction, recycling and/or resource recovery strategies in all States and Territories<sup>140</sup>
- methane gas capture programs (for heat or energy production) at landfills and at some sewage treatment plants in all States and Territories.

#### 13.4.5 Land use, land-use change and forestry

Emissions reductions and sequestration credits in the LULUCF sectors have to date largely offset emissions growth from Australia's other sectors under the accounting rules devised for the Kyoto Protocol. Australia generated net emissions of around 35.5 Mt a year in 2004 as a result of LULUCF activities—around 90 Mt lower than net emissions in 1990. Actions by State and Territory Governments are projected to increase abatement in this sector. Measures in this sector include:

- Queensland's Vegetation Management Framework and the NSW Native Vegetation Act 2003, which will manage emissions from land-use change
- Victoria's CarbonTender, BushTender, and Plantations for Greenhouse schemes to fund new carbon sequestration in that State
- Plantations for Australia: the 2020 vision (all governments)

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<sup>140</sup> *Towards Zero Waste* (Victoria); *Strategic Direction for Waste Management in Western Australia* (WA); *South Australia's Waste Strategy 2005–2010* (SA); *Waste Management Strategy for Queensland* (Qld); *Southern Waste Strategy Authority Five Year Strategy* (Tasmania); *Litter Abatement and Resource Recovery Strategy for the NT* (NT); *No Waste by 2010 – a Waste Management Strategy for Canberra* (ACT); *NSW Waste Avoidance and Resource Recovery Strategy 2003* (NSW).

- National Action Plan for Salinity and Water Quality (all governments)
- Commonwealth Government programs:
  - National Heritage Trust: land and vegetation programs
  - National Landcare Program
- ‘carbon rights’ registers or legislation in WA, NSW, Victoria, Queensland and SA.

### **13.5 International engagement and negotiations**

Controlling the emissions of greenhouse gases that contribute to climate change is a global problem that can be addressed only by effective international action. A number of submissions in response to the Background Paper strongly supported effective international action, RD&D and technology transfer as the solution to greenhouse gas emissions and climate change.

It is critical to recognise the mounting urgency of the problem and engage in international negotiations with renewed vigour, and State and Territory Governments strongly support efforts by the Commonwealth Government to achieve an effective international response to greenhouse gas emissions.

As a middle-sized power, it has always been in Australia’s interest, and historically has been Australia’s approach, to develop effective, rule-based multi-lateral agreements. In respect of climate change, the challenge of achieving such agreements is as great as, or greater than, it is in any other respect. Australia is currently a member or partner in the following international agreements:

- the UNFCCC
- the Asia-Pacific Partnership on Clean Development and Climate
- bilateral partnerships with (each separately): the US; China; New Zealand; the European Union; Japan; and South Africa
- plurilateral partnerships: Methane to Markets Partnership; Renewable Energy and Energy Efficiency Partnership; Carbon Sequestration Leadership Forum; International Partnership for the Hydrogen Economy.

Australia's overarching climate change agreement is the UNFCCC. Its ultimate objective is to achieve:

... stabilization of GHG concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. Such a level should be achieved within a time-frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner.

Under the convention, Australia and other parties:

acknowledge that the global nature of climate change calls for the widest possible cooperation by all countries and their participation in an effective and appropriate international response, in accordance with their common but differentiated responsibilities and respective capabilities and their social and economic conditions

recognise the need for developed countries to take immediate action in a flexible manner on the basis of clear priorities, as a first step towards comprehensive response strategies

recognise that ... in order for developing countries to progress towards [their social and economic goals], their energy consumption will need to grow ...

At the most recent Conference of the Parties (COP 11, held in Montreal, Canada in December 2005) the parties to the UNFCCC agreed to engage in a dialogue on long-term cooperative action to address climate change by enhancing implementation of the Framework Convention. The dialogue will include (among other things):

- advancing development goals in a sustainable way
- addressing action on adaptation
- realising the full potential of technology
- realising the full potential of market-based opportunities.

The Commonwealth Government, along with South Africa, will be co-chairing the three UNFCCC dialogue workshops between now and the end of 2007.

The State and Territory Governments support the efforts by the Commonwealth Government to obtain a constructive and internationally agreed way forward on climate change, through enhancement of implementation of the Framework Convention.

*Comments are sought as to:*

- *whether there are additional complementary measures to improve the effectiveness and efficiency of the NETS that are required, and if so, of what type, and why?*
- *whether any of the complementary measures presented in this Chapter are likely to become less important under a NETS.*

## **14 Next steps**

Written comments are being sought by Friday 22 December 2006 in response to the propositions and issues identified in this Discussion Paper.

Post comments to:

National Emissions Trading Taskforce Secretariat  
The Cabinet Office  
GPO Box 5341  
SYDNEY NSW 2001

Or e-mail comments to:

[submissions@emissionstrading.net.au](mailto:submissions@emissionstrading.net.au)

All submissions will be made public on the Taskforce web site unless marked confidential ([www.emissionstrading.net.au](http://www.emissionstrading.net.au)).

The Taskforce will arrange stakeholder forums on the Discussion Paper in capital cities. The purpose of these forums is to brief stakeholders on the Discussion Paper, discuss key issues and options for the detailed design of a NETS, and ensure stakeholders are aware of how they may participate in the process going forward. Confirmation of dates and venues will be advertised on the Taskforce website.

Stakeholder feedback will inform the decision as to how to progress this proposal further.

## **Abbreviations**

<b>AAU</b>	Assigned amount unit
<b>ABARE</b>	Australian Bureau of Agricultural and Resource Economics
<b>AGO</b>	Australian Greenhouse Office
<b>CAGR</b>	Compound average growth rate
<b>CCGT</b>	Combined cycle gas turbine
<b>CCS</b>	Carbon Capture and Storage
<b>CDM</b>	Clean Development Mechanism
<b>CER</b>	Certified Emissions Reduction
<b>CoPS</b>	Centre of Policy Studies, Monash University
<b>DKIS</b>	Darwin to Katherine Interconnected System
<b>EPHC</b>	Environment Protection and Heritage Council
<b>ESAA</b>	Energy Supply Association of Australia
<b>EU</b>	European Union
<b>EUAA</b>	Energy Users' Association of Australia
<b>EU ETS</b>	European Union Emissions Trading Scheme
<b>GDP</b>	Gross Domestic Product
<b>GEC</b>	Gas Electricity Certificate
<b>GHG</b>	Greenhouse Gas
<b>GGAS</b>	Greenhouse Gas Abatement Scheme
<b>IEA</b>	International Energy Agency
<b>IGCC</b>	Integrated Gasification Combined Cycle

IPCC	Intergovernmental Panel on Climate Change
JI	Joint Implementation [Mechanism]
JISC	Joint Implementation Supervisory Committee
LULUCF	Land Use, Land-use Change and Forestry
MMA	McLennan Magasanik Associates
MRET	Mandatory Renewable Energy Target
MW	Megawatt (can be in terms of electrical power – MWe)
MWh	Megawatt Hour
NEM	National Electricity Market
NEMMCO	National Electricity Market Management Company
NETT	National Emissions Trading Taskforce
NETS	National Emissions Trading Scheme
NFEE	National Framework for Energy Efficiency
NGAC	New South Wales Greenhouse Abatement Certificate
NGGI	National Greenhouse Gas Inventory
RD&D	Research, Development and Demonstration
REC	Renewable Energy Certificate
RGGI	Regional Greenhouse Gas Initiative
SWIS	South West Interconnected System
UNFCCC	United Nations Framework Convention on Climate Change
VRET	Victorian Renewable Energy Target

## Glossary

<b>Abatement activities</b>	Projects or processes that lead to a reduction in greenhouse gas emissions.
<b>Assigned Amount Units</b>	The amount of greenhouse gas that each Annex B country is allowed to emit during the first commitment period of the Kyoto Protocol. An Assigned Amount Unit is a tradable unit of 1 tCO <sub>2</sub> -e.
<b>Australian Energy Market Commission</b>	<p>The Australian Energy Market Commission is a national body, established under the <i>Australian Energy Market Commission Establishment Act 2004</i> (South Australia). The Commission undertakes rule making and market development activities for the National Electricity Market. More specifically the AEMC is responsible for:</p> <ul style="list-style-type: none"> <li>• Administration and publishing of the National Electricity Rules</li> <li>• The Rule making process under the new National Electricity Law</li> <li>• Making determinations on proposed Rules</li> <li>• Undertaking reviews on its own initiative or as directed by the MCE</li> <li>• Providing policy advice to the MCE in relation to the NEM.</li> </ul>
<b>Australian Greenhouse Office</b>	The Australian Greenhouse Office is part of the Department of Environment and Heritage and is principally responsible for delivering the majority of programmes under the Commonwealth Government's climate change strategy.
<b>Additionality</b>	The key aim of an offsets regime is to provide an incentive for abatement that would not otherwise have occurred. That is, offsets should aim to promote 'additional' reductions in emissions compared with a 'business as usual' scenario. This is often referred to as the 'additionality' of an offsets project.
<b>Allocation</b>	The initial distribution of permits created under the scheme cap.
<b>Background Paper</b>	The <i>Background Paper for Stakeholder Consultation</i> released by the National Emissions Trading Taskforce (then Inter-jurisdictional Emissions Trading Working Group) in September 2005.
<b>Baseline emissions</b>	The amount of carbon dioxide emissions that would be emitted by a facility under normal operations, without a reduction

	project being put into place. The baseline refers to the business as usual scenario.
<b>Banking</b>	Banking refers to the ability of liable parties to use permits issued or created in one compliance period to be used in future compliance periods. Banking allows liable parties to better manage annual variations in their emissions profiles. These variations may arise, for example, due to cyclical economic activity or disruptions to production.
<b>Borrowing</b>	Borrowing refers to the ability of liable parties to use credits from future compliance periods to meet their obligations in the current compliance period.
<b>Bilateral linking</b>	Bilateral linking involves the mutual acceptance of credits between two schemes. If the emissions trading schemes are functioning well then bilateral linking should result in movement towards a single price for carbon. Assuming the price of carbon was different in the two schemes prior to linking, the price in one scheme will rise and the price in the other scheme will fall.
<b>Business as usual</b>	An estimate of future patterns of energy consumption and greenhouse gas emissions which assumes that there will be no major changes in attitudes and priorities.
<b>Carbon Sequestration</b>	The uptake and storage of carbon. Trees and plants, for example, absorb carbon dioxide, release the oxygen and store the carbon. Fossil fuels were at one time biomass and continue to store the carbon until burned.
<b>Carbon capture and storage (CCS)</b>	A number of approaches are being investigated to capture carbon dioxide emissions from the generation of electricity. Once captured, carbon would then be transported using high pressure pipelines. Captured carbon dioxide has the potential to be stored in a variety of geological or ocean sites. CCS technologies are currently at the experimental and demonstration phase.
<b>Carbon Dioxide Equivalent (CO<sub>2</sub>-e)</b>	The universal unit of measurement used to compare the emissions from each of the greenhouse gases, based upon their Global Warming Potentials (GWP). It is derived by multiplying the tonnes of the greenhouse gas by the associated GWP.
<b>Compliance period</b>	The period during which liable parties are required to comply with the relevant scheme requirements.
<b>Cap and trade scheme</b>	An emissions trading regime whereby a limit (or cap) is placed on the total emissions allowable from the activities or sectors



	covered under the scheme. Emissions limits are set below what they would be under a business as usual scenario.
<b>Certification</b>	A process whereby an independently accredited body provides an assurance that the emissions reductions being claimed have actually occurred.
<b>Certified Emissions Reductions (CERs)</b>	Certified Emissions Reductions are credits created under the Clean Development Mechanism. For afforestation and reforestation projects, credits expire either at the end of the next compliance period (tCERS) or at the end of the project accrediting period (lCERs).
<b>Clean Development Mechanism (CDM)</b>	The Clean Development Mechanism was established by Article 12 of the Kyoto Protocol for project-based emission reduction activities in developing countries. The CDM is designed to meet two main objectives: to address the sustainable development needs of the host country, and to increase the opportunities available to Annex B Parties to meet their reduction commitments. Emissions reductions under the CDM can create tradable permits called Certified Emissions Reductions (CERs). (Source: Climate Partner.)
<b>Cogeneration</b>	Production of two useful forms of energy such as high-temperature heat (for hot water or space heating) and electricity from the same process. Also known as combined heat and power.
<b>COP/MOP</b>	The Conference of the Parties to the UN Framework Convention on Climate Change, serving as the Meeting of the Parties to the Kyoto Protocol.
<b>Coverage</b>	The scope of the emissions trading scheme. Covered sectors are liable for their emissions under the scheme.
<b>DKIS</b>	Darwin-Katherine Interconnected System.
<b>Emissions trading</b>	An administrative approach used to reduce the cost of emissions control by providing economic incentives for achieving reductions in emissions.
<b>Emission cap</b>	The limit on the number of tonnes of greenhouse gas that can be emitted by covered sectors without incurring a penalty.
<b>Emission Reduction Units</b>	The tradable certificate that represents a specified amount of greenhouse gas emissions reductions achieved through a Joint Implementation project.

<b>Emissions factor</b>	A unique value for scaling emissions to activity data in terms of a standard rate of emissions per unit of activity (e.g., grams of carbon dioxide emitted per barrel of fossil fuel consumed).
<b>Emissions intensity</b>	A level or amount of emissions per some unit of economic output, such as GDP, sales revenue, or goods produced.
<b>Environmental additionality</b>	A test of whether the offsets project actually reduces emissions. This is closely linked with the establishment of baseline scenarios for individual projects and for project sectors, and can be effectively dealt with in the construction of specific rules for setting baselines and monitoring project activities.
<b>European Union Emissions Trading Scheme (EU ETS)</b>	The cap and trade scheme operating in the European Union: currently covering over 11,500 industrial plants across 25 member states. The Scheme came into operation in January 2005 with the first phase (allocation period) running to the end of 2007 – after which several key aspects of the scheme (such as allocation and coverage) may change.
<b>Financial additionality</b>	Financial/investment additionality is generally taken to mean that the offsets project would not have taken place if revenue from the creation of offset credits were not available.
<b>Fugitive emissions</b>	Emissions associated with gas leaks from the mining, processing, transmission and/or transportation of fossil fuels.
<b>Gas Electricity Certificates (GECs)</b>	An electronic certificate created under the Queensland 13% Gas Scheme for each whole MWh of eligible gas-fired electricity.
<b>Gateway</b>	A potential range for future caps under the emissions trading scheme.
<b>Geosequestration</b>	The technology that aims to store carbon dioxide in deep underground rock structures.
<b>Global warming potential (GWP)</b>	The index used to translate the level of emissions of various gases into a common measure in order to compare the relative radiative forcing of different gases without directly calculating the changes in atmospheric concentrations. GWPs are calculated as the ratio of the radiative forcing that would result from the emission of one kilogram of a greenhouse gas to that from the emission of one kilogram of carbon dioxide over a period of time (usually 100 years). (Source: <a href="http://www.unfccc.int">www.unfccc.int</a> )
<b>Greenhouse Gas</b>	Any gas that absorbs infrared radiation in the atmosphere. Greenhouse gases include, but are not limited to, water vapour, carbon dioxide (CO <sub>2</sub> ), methane (CH <sub>4</sub> ), nitrous oxide (N <sub>2</sub> O),

	hydrochlorofluorocarbons (HCFCs), ozone (O <sub>3</sub> ), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulphur hexafluoride (SF <sub>6</sub> ). (Source: <a href="http://www.unfccc.int">www.unfccc.int</a> )
<b>Greenhouse Gas Abatement Scheme</b>	The NSW and ACT Greenhouse Gas Abatement Scheme.
<b>Joint implementation mechanism (JI)</b>	Mechanism established under the Kyoto Protocol that allows one developed country to earn credits (ERUs) when it finances projects that reduce emissions in another developed country. The credits can then be used to meet the obligations under the Protocol.
<b>Joint Implementation Supervisory Committee (JISC)</b>	The Joint Implementation Supervisory Committee (JISC) supervises the verification of ERUs generated by joint implementation projects following the verification procedures set out by the JISC.
<b>Kyoto Protocol</b>	The agreement made under the United Nations Framework Convention on Climate Change (UNFCCC). The Protocol entered into force on 16 February 2005. Ratifying countries listed in Annex B to the Protocol have committed to meet targets that reduce their greenhouse gas emissions over the period 2008–2012, compared with 1990 levels.
<b>Landfill gas</b>	Gas generated by the natural degrading and decomposition of municipal solid waste by anaerobic micro-organisms in sanitary landfills. The gases produced, carbon dioxide and methane, can be collected by a series of low-level pressure wells and can be processed into a medium Btu gas that can be burned to generate steam or electricity. (Source: California Energy Commission)
<b>Legal additionality</b>	See Regulatory additionality
<b>Liable parties</b>	Firms that have a direct obligation under the NETS to surrender permits equal to their emissions during the compliance period.
<b>Low emissions technologies</b>	Technologies that aim to reduce emissions from fossil fuel generation plant to near zero levels. They include technologies such as black coal integrated gasification combined cycle and brown coal integrated dewatered gasification combined cycle, combined with the ability to undertake carbon capture and storage. These technologies are currently at the experimental and demonstration phase.
<b>Marginal Abatement Cost</b>	The cost of reducing emissions by one additional unit (e.g. by 1 tonne).

<b>Make-good provision</b>	<p>A requirement that if a liable party has emissions in excess of its permit holdings at the end of a compliance period, it must find and surrender an additional quantity of permits sufficient to cover ('make good') the excess emissions.</p> <p>The term 'make good' is also used to refer to a requirement that the buyer or seller of offset credits must purchase permits or credits from another source if the original offsets project fails to achieve or maintain the quantity of abatement needed to create the offset credits.</p>
<b>Mandatory Renewable Energy Target (MRET)</b>	The Commonwealth Government's tradable certificate scheme that requires 9,500 GWh of additional generation to be provided from renewable sources by 2010.
<b>Megawatt (MW)</b>	A standard measure of electric power plant generating capacity; a megawatt equals one thousand kilowatts or 1 million watts. (Source: U.S. Department of Energy). As a watt is a measure of energy output over time, the abbreviations MWe and MWth are sometimes used to represent electrical energy and thermal energy respectively.
<b>Ministerial Council on Energy (MCE)</b>	The MCE is the national policy and governance body for the Australian energy market, including for electricity and gas, as outlined in the COAG Australian Energy Market Agreement (AEMA) of 30 June 2004.
<b>National Electricity Code Administrator (NECA)</b>	NECA was established to supervise, administer and enforce the National Electricity Code. From 1 July 2005, the roles and functions of NECA were replaced by the Australian Energy Market Commission and the Australian Energy Regulator.
<b>National Emissions Trading Taskforce (NETT)</b>	The Taskforce comprises senior representatives of State and Territory Governments. It was established (as the Inter-jurisdictional Emissions Trading Working Group) in 2004 to develop a national emissions trading scheme design for consideration by State and Territory Governments.
<b>National Environment Protection Council (NEPC)</b>	The National Environment Protection Council is a statutory body with law making powers established under the National Environment Protection Council Act 1994 (Commonwealth), and corresponding legislation in the other jurisdictions. Members of Council are Ministers, not necessarily Environment Ministers, appointed by First Ministers from the participating jurisdictions (i.e. Commonwealth, State or Territory Governments). The role of the Council is to make National Environment Protection Measures and to assess and report on their implementation and effectiveness in participating jurisdictions.

<b>National Environment Protection Measure (NEPM)</b>	A National Environment Protection Measure is a broad framework-setting statutory instrument defined in the <i>National Environment Protection Council Act 1994</i> (Cth). A NEPM outlines agreed national objectives for protecting or managing particular aspects of the environment. NEPMs are similar to environmental protection policies. NEPMs may consist of any combination of goals, standards, protocols, and guidelines.
<b>National Pollutant Inventory (NPI)</b>	The National Pollutant Inventory (NPI) is a NEPM that reports on pollutant emissions from industry and diffuse sources. The location of pollutant sources is also provided.
<b>National Electricity Market (NEM)</b>	The NEM began operating as a wholesale market for the supply of electricity to retailers and end-users in the interconnected regions of Queensland, New South Wales, the Australian Capital Territory, Victoria and South Australia in December 1998. Tasmania joined the NEM in 2005.
<b>National Electricity Market Management Company (NEMMCO)</b>	NEMMCO was established in 1996 to administer and manage the NEM, develop the market and continually improve its efficiency. The governments of Queensland, New South Wales, the Australian Capital Territory, Victoria, South Australia and Tasmania are members of NEMMCO.
<b>Offsets</b>	A reduction or removal of greenhouse gas emissions that is used to counterbalance emissions elsewhere in the economy.
<b>Parties</b>	Parties to an international treaty are countries that have ratified a treaty that has (either subsequently or previously) entered into force.
<b>Permit</b>	A certificate that enables a liable party under the emissions trading scheme to emit a quantity of greenhouse gas.
<b>Permanence</b>	A requirement that greenhouse gases removed from the atmosphere be removed permanently if offset credits are to be created. See also 'Make good provision'.
<b>Regulatory additionality</b>	A test of whether an offsets project is being undertaken simply to comply with existing legal and regulatory requirements, or whether it is in excess of those requirements. It is essential that existing legal and regulatory requirements be part of the eligibility testing for offsets projects to avoid the creation of offset credits for simply complying with prevailing laws and regulations.
<b>Removal units (RMUs)</b>	Issued for increased stocks of carbon in forests or agricultural soils in countries that are Annex B parties to the Kyoto Protocol.

<b>Regional Greenhouse Gas Initiative (RGGI)</b>	A proposed emissions trading scheme to be implemented by eight North-eastern and Mid-Atlantic states of the United States to reduce carbon dioxide emissions.
<b>Renewable Energy Certificates (RECs)</b>	Tradable certificates issued to accredited renewable energy generators under the MRET scheme.
<b>Sinks</b>	Natural or human activity that removes carbon from the atmosphere – for example the absorption of carbon by trees.
<b>SWIS</b>	South West Interconnected System.
<b>Ten design propositions</b>	In March 2005, State and Territory leaders released a communiqué that endorsed ten key design elements of an emissions trading scheme to be used as the basis for further investigation of scheme design.
<b>Unilateral linking</b>	Unilateral linking of a domestic emissions trading scheme to an overseas scheme occurs when permits under the overseas scheme can be surrendered against emissions liabilities in the domestic scheme, but domestic scheme permits cannot be used in the overseas scheme. The two markets remain separate and a single price for carbon does not emerge.
<b>United Nations Framework Convention on Climate Change (UNFCCC)</b>	An international treaty that entered into force in 1994. The Convention established an objective of avoiding dangerous anthropogenic climate change, and set out provisions outlining actions to avoid future increases in global warming (including non-binding emissions targets for developed countries) and provisions to cope with whatever temperature increases are inevitable. Australia is a Party to the Convention.
<b>Verification</b>	See certification.
<b>Zero-emissions technologies</b>	Technologies that do not emit greenhouse gases. They include solar, wind and hydroelectric power.

